5th IWHA Conference.Tampere Finland 2007. Pasts and Futures of Water. University of Tampere 13-17 June 2007

General information
Publication status: Published
MoE publication type: C2 Edited books
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Hautamäki, I. (ed.), Juuti, P. (ed.), Katko, T. (ed.), Rajala, R. (ed.), Vinnari, E. (ed.)
Publication date: 2007

Publication information
Publisher: Unknown Publisher
ISBN (Print): 978-951-44-6971-8
Original language: English

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14274
Research output: Book/Report › Anthology › Scientific › peer-review

Accelerated deactivation studies of the natural-gas oxidation catalyst-Verifying the role of sulfur and elevated temperature in catalyst aging

Accelerated deactivation, caused by thermal aging (TA) and/or sulfur+water poisoning (SW), of the PtPd/γ-Al_2O_3 natural-gas oxidation catalyst was studied. Thermal aging and poisoning treatments were performed separately and with varied combinations and comprehensive characterization of the catalyst was carried out after each step. The fresh catalyst has small, oxidized PtPd particles (<5nm) uniformly distributed in the γ-alumina washcoat. After the SW-treatment, a small amount of bulk aluminum sulfate was observed near the slightly grown noble metal particles. During the thermal aging, γ-alumina changed to δ-/θ- and α-alumina. In addition, total decomposition of oxidized Pt and partly decomposition of oxidized Pd occurred resulting in the formation of the grown noble metal particles with a bimetallic PtPd core and a polycrystalline PdO shell. Also few, small (~5nm) bimetallic PtPd particles were still detected. In the TA+SW-treated catalyst with grown noble metal particles, a small amount of bulk aluminum sulfate was detected and it was randomly distributed over the noble metal particles and washcoat. The activity in the terms of methane conversion over the TA-, SW-, and SW+TA-treated catalysts was similar but it was decreased compared to the fresh catalyst. The activity of the TA+SW-treated catalyst was drastically decreased compared to the fresh catalyst due to significant morphological changes and aluminum sulfate formation.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Materials Science, Research group: Materials Characterization, University of Oulu, Aalto University, Chalmers University of Technology, Dinex Ecocat Oy
Contributors: Honkanen, M., Kärkkäinen, M., Kolli, T., Heikkinen, O., Viitanen, V., Zeng, L., Jiang, H., Kallinen, K., Huuhtanen, M., Keiski, R. L., Lahtinen, J., Olsson, E., Vippola, M.
Number of pages: 10
Pages: 439-448
Publication date: 2016
Peer-reviewed: Yes
Early online date: 1 Oct 2015

Publication information
Journal: Applied Catalysis B-Environmental
ISSN (Print): 0926-3373
Ratings:

Scopus rating (2016): CiteScore 14.9 SJR 2.693 SNIP 2.208
Original language: English
ASJC Scopus subject areas: Catalysis, Process Chemistry and Technology, Environmental Science(all)
Keywords: Deactivation, Palladium, Platinum, Sulfur poisoning, Thermal aging
Electronic versions:

Honkanen et al_revised manuscript. Embargo ended: 1/10/17
DOIs:

10.1016/j.apcatb.2015.09.054
URLs:

http://urn.fi/URN:NBN:fi:tty-201606134232 . Embargo ended: 1/10/17
Source: Scopus
Source ID: 84943638016

Research output: Contribution to journal › Article › Scientific › peer-review

Acceptability of contaminated soils and waste materials in landfill structures

General information
Publication status: Published
Organisations: Civil Engineering, Research group: Earth Constructions
Contributors: Leppänen, M. M., Kuula, P.
Publication date: 2016
Peer-reviewed: Unknown
Event: Paper presented at Nordrocs, .
URLs:

http://nordrocs.org/wp-content/uploads/2016/09/kompendium08282016.pdf
Research output: Other conference contribution › Paper, poster or abstract › Professional

Access to Water? Dynamic Capacity Change for Sustainable Rural Water and Sanitation Services for All
The lack of adequate safe drinking-water together with poor sanitation and hygiene imposes an extremely high disease burden on millions of children and adults. This compromises well-being and productivity, and aggravates the cycle of poverty. Cultivating capacity for change is an important element of practically every policy reform, development programme, and country strategy aiming to improve well-being of its citizens, and with it also, e.g., water services and sanitation. The purpose of this dissertation was to recommend ways for rural water and sanitation sector specific programmes and projects to inspire capacity change for continued learning, adaptation, and innovation in the face of ever-new challenges in a volatile and unpredictable local and global environment, while the system in itself was assumed to be complex and wicked already at the present time.

The specific objective was to develop futures-oriented frame of reference that can be applied for policy, programme, and project purposes. It draws from a wide range of action research the author has been involved with in Nepal, Guyana, Tanzania, and Bangladesh. It consists of six international peer-reviewed scientific articles and three case studies. The approach is constructivist and actororiented, it pays attention to agency and institutions, is plural rather than singular, differentiating rather than generalizing. The frame of reference is based on three analytical levels: 1) individual, 2) organizational/institutional, and 3) enabling environment.

Rural water sector must pay attention to rural livelihoods and cross-sectoral issues to truly benefit rural development and well-being. This can be done through the multiple-use water services paradigm, adding ecological sanitation. Two of the articles studied a bi-lateral water project in Nepal that combined water supply, sanitation, irrigation, and hydro-energy with livelihoods, small cottage industries and micro-finance (cooperatives) within one project operating through local government.Conceptually and policy-wise complex system translated into tangible benefits and positive impacts in the poorest and remotest corners of Nepal once the enabling environment was conducive to allow this. It proved out to be a useful instrument for making change happen, empowering communities and encouraging continuous learning, innovation, and adaptation. Empowerment is here defined as group's or individuals' capacity to make effective choices and then transform these choices into desired actions and outcomes and with these, into services and benefits.

Capacity related interventions need to have a vision that goes further than just the present state of affairs. Appreciating the complexity and dynamic nature of the rural water sector, the system should not be split into individual components or activities, such as individual training courses or narrow mandates that do not consider the broader framework within which they must operate and change.
The 'capacity cube' in this dissertation represents the 'present' that moves across its different dimensions simultaneously and is in constant change in time. Framing the 'cube' allows the project or programme planners to establish the external layers of reference to give shape for the time dimension, the expected results ('services'), the external and internal drivers and barriers to change in terms of enabling environment, and the institutions and humans therein. Among others, it recommended to further study scale application of multiple use water services with ecological sanitation in the livelihoods context and the rural water service delivery paradigm.

General information
Publication status: Published
MoE publication type: G5 Doctoral dissertation (article)
Organisations: Department of Civil Engineering
Contributors: Rautanen, S.
Number of pages: 112
Publication date: 18 Mar 2016

Publication information
Publisher: Tampere University of Technology
ISBN (Print): 978-952-15-3707-3
ISBN (Electronic): 978-952-15-3718-9

Original language: English

Publication series
Name: Tampere University of Technology. Publication
Publisher: Tampere University of Technology
Volume: 1373
ISSN (Print): 1459-2045
Keywords: water, sanitation, rural, capacity, livelihoods, future, change
Electronic versions:

Rautanen 1373
URLs:

http://urn.fi/URN:ISBN:978-952-15-3718-9
Research output: Book/Report › Doctoral thesis › Collection of Articles

Accidents and close call situations connected to the use of mobile phones

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L., Pääkkönen, R.
Pages: 75-82
Publication date: 2012
Peer-reviewed: Yes

Publication information
Journal: Accident Analysis and Prevention
Volume: 45
ISSN (Print): 0001-4575
Ratings:

Scopus rating (2012): CiteScore 3.8 SJR 1.326 SNIP 2.258
Original language: English
DOIs:

10.1016/j.aap.2011.11.016

Bibliographical note
Contribution: organisation=epr,FACT1=1
Publisher name: Elsevier Ltd
Source: researchoutputwizard
Source ID: 4534
Research output: Contribution to journal › Article › Scientific › peer-review

Acetotrophic Activity Facilitates Methanogenesis from LCFA at Low Temperatures: Screening from Mesophilic Inocula

The inoculum source plays a crucial role in the anaerobic treatment of wastewaters. Lipids are present in various wastewaters and have a high methanogenic potential, but their hydrolysis results in the production of long chain fatty acids (LCFAs) that are inhibitory to anaerobic microorganisms. Screening of inoculum for the anaerobic treatment of LCFA-containing wastewaters has been performed at mesophilic and thermophilic conditions. However, an evaluation of inocula for producing methane from LCFA-containing wastewater has not yet been conducted at low temperatures and needs to be undertaken. In this study, three inocula (one granular sludge and two municipal digester sludges) were assessed for methane production from LCFA-containing synthetic dairy wastewater (SDW) at low temperatures (10 and 20°C). A methane yield (based on mL-CH4/g-CODadded) of 86-65% with acetate and 45-20% with SDW was achieved within 10 days using unacclimated granular sludge, whereas the municipal digester sludges produced methane only at 20°C but not at 10°C even after 200 days of incubation. The acetotrophic activity in the inoculum was found to be crucial for methane production from LCFA at low temperatures, highlighting the role of Methanosaeta (acetoclastic archaea) at low temperatures. The presence of bacterial taxa from the family Syntrophaceae (Syntrophus and uncultured taxa) in the inoculum was found to be important for methane production from SDW at 10°C. This study suggests the evaluation of acetotrophic activity and the initial microbial community characteristics by high-throughput amplicon sequencing for selecting the inoculum for producing methane at low temperatures (up to 10°C) from lipid-containing wastewaters.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Materials Science and Environmental Engineering, Research group: Bio- and Circular Economy, Natl. University of Ireland, Galway
Contributors: Singh, S., Rinta-Kanto, J., Kettunen, R., Lens, P., Collins, G., Kokko, M., Rintala, J.

Publication date: 2019
Peer-reviewed: Yes

Publication information
Journal: ARCHAEA
Volume: 2019
Article number: 1751783
ISSN (Print): 1472-3646
Ratings:
Scopus rating (2019): CiteScore 5.4 SJR 1.188 SNIP 0.846
Original language: English
Electronic versions:
singh et al. 2019
DOIs:
10.1155/2019/1751783
URLs:
http://urn.fi/URN:NBN:fi:tty-201905201648
Research output: Contribution to journal › Article › Scientific › peer-review

Acid Leaching of Cu and Zn from a Smelter Slag with a Bacterial Consortium

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, CSIRO
Contributors: Tuovinen, O. H., Särkijärvi, S., Peuraniemi, E., Junnikkala, S., Puhakka, J. A., Kaksonen, A. H.
Number of pages: 4
Pages: 660-663
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Advanced Materials Research
Volume: 1130
ISSN (Print): 1022-6680
Ratings:
Scopus rating (2015): CiteScore 0.08 SJR 0.115 SNIP 0.105
Original language: English
DOIs:
10.4028/www.scientific.net/AMR.1130.660

Bibliographical note
EXT="Kaksonen, Anna H."
Research output: Contribution to journal › Article › Scientific › peer-review

A comparison of occupational electric field exposures during working tasks at 400 kV and 110 kV substations

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L., Kuisti, H., Pääkkönen, R., Gobba, F.
Publication date: 2012

Host publication information
Title of host publication: Proceedings - 7th International Workshop on Biological Effects of Electromagnetic Fields, 7th IWSBEEMF, 8 - 12 October 2012, Valletta, Malta
Publisher: Electromagnetic Research Group - EMRG (Malta); Departmet of Physics, University of Malta
ISBN (Print): 978-99957-0-361-5

Publication series
Name: International Workshop on Biological Effects of Electromagnetic Fields
URLs:

http://www.um.edu.mt/events/emf2012/proceedings

Bibliographical note
ei ut-numeroa 19.8.2013
Contribution: organisation=epr,FACT1=1
Publisher name: Electromagnetic Research Group - EMRG (Malta); Departmet of Physics, University of Malta
Source: researchoutputwizard
Source ID: 4532
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

A comparison of the usability of a laptop, communicator, and handheld computer

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Suomalainen, P., Korpinen, L., Pääkkönen, R.
Number of pages: 13
Pages: 111-123
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Journal of Usability Studies
Volume: 5
Issue number: 3
ISSN (Print): 1931-3357
Original language: English
URLs:

http://www.upassoc.org/upa_publications/jus/2010may/suomalainen-authors.html

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 9341
Research output: Contribution to journal › Article › Scientific › peer-review

Adaptation of Black Carbon Footprint concept would accelerate mitigation of global warming

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Physics, Research group: The Instrumentation, Emissions, and Atmospheric Aerosols Group, Industrial Engineering and Management, Research group: Cost Management Center, Materials Science and Environmental Engineering, Research group: Bio- and Circular Economy, Atmospheric Composition Research, Finnish Meteorological Institute, Tampere University, Servicio Meteorológico Nacional, VTT Technical Research Centre of Finland, Helsinki Region Environmental Services Authority (HSY), Department of Environmental Sciences, Helsinki University, Helsinki Region Environmental Services Authority HSY, Helsinki Region Environmental Services Authority, Helsinki Region Environmental Services Authority (HSY), Finnish Environment Institute, University of Eastern Finland, Finnish Meteorological Institute, Helsinki, Airmodus Oy, Centro Mario Molina Chile, Lund University, Aristotle University of Thessaloniki, Universidad de Chile
Contributors: Timonen, H., Karjalainen, P., Aalto, P., Saarikoski, S., Mylläri, F., Karvosenoja, N., Jalava, P., Asmi, E., Aakko-Saksa, P., Saukkonen, N., Laine, T., Saarnio, K., Niemelä, N., Enroth, J., Väkevä, M., Oyola, P., Pagels, J., Ntzachristos, L., Cordero, R., Kuittinen, N., Niemi, J. V., Rönkkö, T.
Pages: 12153-12155
Publication date: 2019
Peer-reviewed: Yes

Publication information
Journal: Environmental Science and Technology
Volume: 53
Issue number: 21
ISSN (Print): 0013-936X
Ratings:

Scopus rating (2019): CiteScore 12.6 SJR 2.704 SNIP 2.06

Original language: English
DOIs:
10.1021/acs.est.9b05586

Bibliographical note
DUPL=50894228
Merkitty Julk0000 Virta-siirtoa varten
Research output: Contribution to journal › Article › Scientific › peer-review

A decade of Finnish engineering education for sustainable development
Purpose

The paper aims to examine the current status and development of sustainable development in Finnish engineering education.
Design/methodology/approach

The study consists of interviews with key stakeholders supplemented with the analysis of documented material. Development is discussed in relation to the findings of collaborative strategy process in the year 2009.
Findings

The paper observes that the Finnish universities providing engineering education are committed to sustainable development in their strategies. However, a lot of work remains to be done before the strategies are implemented and sustainable development is integrated to all degree programs. Explicit knowledge and individual learning in clearly defined disciplinary boundaries have been the main focus of engineering education.
Practical implications

The paper suggests that engineers need to be provided with mental tools to cope with uncertainty, complexity and ambiguity. Key competencies include holistic understanding, communication and collaboration skills, ability and willingness for critical and reflective thinking, creativity, innovativeness and entrepreneurship. Thus, collaborative learning, open dialogue and innovation are at the heart of education for sustainable development.
Originality/value

This paper has a relatively wide approach as it analyses sustainable development in the context of Finnish engineering education both on institutional and societal levels and is based on a national project.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Civil Engineering, Keva
Contributors: Takala, A., Korhonen-Yrjänheikki, K.
Pages: 170-186
Publication date: 2019
Peer-reviewed: Yes

Publication information
Journal: INTERNATIONAL JOURNAL OF SUSTAINABILITY IN HIGHER EDUCATION
Volume: 20
Issue number: 1
ISSN (Print): 1467-6370
Ratings:
Scopus rating (2019): CiteScore 3.2 SJR 0.635 SNIP 1.329
Original language: English
DOIs:
10.1108/IJSHE-07-2018-0132
Research output: Contribution to journal › Article › Scientific › peer-review

Adjoint-based optimization in the development of low-emission industrial boilers
A gradient-based method has been developed and programmed to optimize the NH (Formula presented.) injections of an existing biomass-fired bubbling fluidized bed boiler, the targets being to minimize both the NO and the NH (Formula presented.) emissions. In this context, the reactive flow inside the boiler is modelled using a custom-built OpenFOAM (Formula presented.) solver, and then the NO and NH (Formula presented.) species are calculated using a post-processing technique. The multiobjective optimization problem is solved by optimizing several weight combinations of the objectives using the gradient-projection method. The required sensitivities were calculated by differentiating the post-processing solver according to the discrete adjoint method. The adjoint-based sensitivities are validated against finite differences calculations. Moreover, in order to evaluate the optimization results, the optimization problem is solved using

evolutionary algorithms software. Finally, the optimization results are physically interpreted and the strengths and weaknesses of the proposed method are discussed.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Materials Science and Environmental Engineering, Research group: Bio- and Circular Economy
Contributors: Kanellis, G., Oksanen, A., Konttinen, J.
Number of pages: 21
Publication date: 2020
Peer-reviewed: Yes

Publication information
Journal: Engineering Optimization
ISSN (Print): 0305-215X
Original language: English
ASJC Scopus subject areas: Computer Science Applications, Control and Optimization, Management Science and Operations Research, Industrial and Manufacturing Engineering, Applied Mathematics
Keywords: adjoint, boiler, CFD, emissions, optimization
Electronic versions:

Adjoint-based optimization 2020
DOIs:

10.1080/0305215X.2020.1781842
URLs:

http://urn.fi/URN:NBN:fi:tuni-202008246599
Source: Scopus
Source ID: 85088050023
Research output: Contribution to journal › Article › Scientific › peer-review

Adjustable hydrophilicity and hydrophobicity on paperboard by liquid flame spray process

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering, Department of Physics
Contributors: Stepien, M., Saarinen, J. J., Teisala, H., Tuominen, M., Aromaa, M., Kuusipalo, J., Mäkelä, J., Toivakka, M.
Pages: 6 p
Publication date: 2010

Host publication information
Title of host publication: 2010 TAPPI Advanced Coating Fundamentals Symposium, October 11-13, 2010, Munich, Germany

Bibliographical note
Contribution: organisation=epr pap,FACT1=0.5
Contribution: organisation=fys,FACT2=0.5
Source: researchoutputwizard
Source ID: 9324
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Adjustable wettability of paperboard by liquid flame spray nanoparticle deposition

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Research area: Aerosol Physics, Department of Energy and Process Engineering, Department of Physics, Engineering materials science and solutions (EMASS)
Contributors: Stepien, M., Saarinen, J. J., Teisala, H., Tuominen, M., Aromaa, M., Kuusipalo, J., Mäkelä, J. M., Toivakka, M.
Pages: 1911-1917
Publication date: 2011
Peer-reviewed: Yes

Publication information
Journal: Applied Surface Science

Volume: 257
Issue number: 6
ISSN (Print): 0169-4332
Ratings:

Scopus rating (2011): CiteScore 3.4 SJR 0.908 SNIP 1.379
Original language: English
DOIs:

10.1016/j.apsusc.2010.09.025

Bibliographical note

Contribution: organisation=epr pap,FACT1=0.5
Contribution: organisation=fys,FACT2=0.5
Publisher name: Elsevier
Source: researchoutputwizard
Source ID: 7308
Research output: Contribution to journal › Article › Scientific › peer-review

ADM1 Based Mathematical Models For Assessing The Effect Of Trace Elements Dynamics On Solid Waste Anaerobic Digestion

Anaerobic digestion (AD) is one of the most trace element (TE) rich metabolic processes in biology. Indeed, TEs are important structural components of various enzymes in the AD process. The role and fate of TEs (Fe, Ni and Co) in AD is poorly understood due to their complex biogeochemistry. The low detection limit of analytical instruments and the time consuming and challenging nature of the experimental procedures are major obstacles to the quantification of TEs in AD. In this thesis, three separate mathematical models based ADM1 have been developed to simulate the TEs dynamics and speciation pattern in an AD reactor. In particular, a TE precipitation/dissolution model, a TE complexation model and a TE adsorption model have been progressively developed to predict the effect, role and fate of TEs in an AD batch system. In all the models the extent of microbial activity in the AD process is a function of the free TE concentration in the liquid phase, which is in equilibrium with the physicochemistry of the AD reactor. The precipitation/dissolution model considers the interactions of TEs with inorganic carbon (e.g. HCO3- and CO32-), phosphorous (e.g. PO43-, HPO42-, H2PO4-) and sulfur (e.g. HS- and S2-) components. New chemical equilibrium acid-base and precipitation reactions have been implemented to study the interactions of Fe, Ni, Co with carbonate, phosphate and sulfide components. The effects of deficiency, stimulation, inhibition and toxicity of TEs on microbial activity have been modelled based on a hormesis type TE dose-response inhibition function. The microbial uptake of TE and the TE inhibition on special microbial activities have been defined as well. Release of TEs as a disintegration product has been also considered to account for the TE content of the organic substrate. Model scenarios have been simulated to analyze the dynamics of TEs, starvation of TEs and the effect of initial sulfur-phosphorus ratio. In the complexation model, the interactions of TEs with organic chelators have been predicted. TE complexation reactions with VFAs and EDTA have been incorporated in the extended ADM1 model in addition to TE precipitation/dissolution processes. New acid-base chemical equilibrium reactions have been incorporated to model the dynamics of EDTA species. Complexation process rates have been defined as well. The model is able to quantify the effect of EDTA/VFA -TE complexation on methane production. Further, effect of initial Ca and Mg concentration on TE complexation has been predicted in a separate modelling scenario. Finally, a general framework able to take into account the precipitation/dissolution and complexation reactions, as well as the interaction of TEs with various surfaces available in the AD system has been developed. The model tracks the TEs dynamics in a batch anaerobic digester and as an extension of the previous contributions, incorporates the adsorption reactions of TEs with biomass, inert and precipitate (FeS). The concepts of free and occupied binding sites, and binding site density for the various surfaces have been incorporated into the model. Simulation scenarios were able to predict the effect of various organic matter concentrations, initial TE concentrations, initial Ca-Mg concentrations, initial EDTA concentrations and change in TE binding site density for biomass, inert and precipitate on cumulative methane production and TE speciation.

General information

Publication status: Published
MoE publication type: G5 Doctoral dissertation (article)
Organisations: Materials Science and Environmental Engineering
Contributors: Maharaj, B.
Number of pages: 73
Publication date: 10 Dec 2019

Publication information

Publisher: Tampere University
Original language: English
URLs:

http://urn.fi/URN:NBN:fi:tuni-202001211432. Embargo ended: 10/12/20
Research output: Book/Report › Doctoral thesis › Collection of Articles

Airtightness of residential buildings in Finland

Single-family buildings and apartments in multi-family apartment buildings have been studied in Finland in two large-scale studies between the years 2002 and 2009. This paper is based on the measurements of airtightness of 170 single-family detached houses and 56 apartments by fan pressurisation method at 50 Pa.The mean air change rate of 10 autoclaved aerated concrete block, 10 shuttering concrete block, 10 concrete element, 10 brick masonry, 10 lightweight aggregate concrete block, 100 timber-framed, and 20 log single-family houses was 1.5 h⁻¹, 1.6 h⁻¹, 2.6 h⁻¹, 2.8 h⁻¹, 3.2 h⁻¹, 3.9 h⁻¹ and 6.0 h⁻¹, respectively. In concrete-built multi-storey houses, in which the intermediate floor was cast on site, the mean n<inf>50</inf>-value of 23 apartments was 0.7 h⁻¹. The mean n<inf>50</inf>-value of 20 apartments in multi-storey houses built from concrete elements was 1.6 h⁻¹. 16 apartments in timber-framed multi-storey houses had a mean n<inf>50</inf>-value 2.9 h⁻¹.Factors like construction method and insulation material (polyurethane insulation) in timber-framed houses, seam insulation material in log houses and ceiling structure in heavyweight buildings among others were found to have an effect on the average values of air change rates. The mean values of airtightness do not satisfy the recommended level of airtightness in Finland. Most important result, however, is that good airtightness of individual houses was reached within all house groups regardless of the choice of structure, storeys, ventilation system or technology of construction.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Life Cycle Effectiveness of the Built Environment (LCE@BE), Aalto University, Department of Civil and Structural Engineering
Contributors: Vinha, J., Manelius, E., Korpi, M., Salminen, K., Kurnitski, J., Kiviste, M., Laukkarinen, A.
Number of pages: 13
Pages: 128-140
Publication date: 1 Nov 2015
Peer-reviewed: Yes

Publication information

Journal: Building and Environment
Volume: 93
Issue number: P2
ISSN (Print): 0360-1323
Ratings:

Scopus rating (2015): CiteScore 6.9 SJR 2.067 SNIP 2.498
Original language: English
ASJC Scopus subject areas: Civil and Structural Engineering, Environmental Engineering, Geography, Planning and Development, Building and Construction
Keywords: Air change rate, Air leakage, Airtightness, Residential buildings
Electronic versions:

Kiviste - Airtightness of residential buildings in Finland. Embargo ended: 11/06/17
DOIs:

10.1016/j.buildenv.2015.06.011
URLs:

http://urn.fi/URN:NBN:fi:tuni-201911216158. Embargo ended: 11/06/17
URLs:

http://www.scopus.com/inward/record.url?scp=84938085676&partnerID=8YFLogxK (Link to publication in Scopus)
Source: Scopus
Source ID: 84938085676
Research output: Contribution to journal › Article › Scientific › peer-review

A laboratory listening experiment on subjective and objective rating of impact sound insulation of concrete floors

General information

Publication status: Published
MoE publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Civil Engineering, Research group: Building Acoustics, Turku University of Applied Sciences
Contributors: Kylliäinen, M., Hongisto, V., Oliva, D., Rekola, L.
Number of pages: 9
Pages: 894-902
Publication date: Aug 2016

Host publication information

Title of host publication: Proceedings of the INTER-NOISE 2016, 45th International Congress on Noise Control Engineering : Towards a Quieter Future, August 21-24, 2016, Hamburg, Germany

Place of publication: Hamburg
Publisher: German Acoustical Society (DEGA)
Article number: 193
ISBN (Electronic): 978-3-939296-11-9
URLs:
http://pub.dega-akustik.de/IN2016/data/articles/000193.pdf
http://www.internoise2016.org/
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific

Älypölkky, radan monitorointi, kreosoottipölkyn korvaavat vaihtoehdot

General information
Publication status: Published
Organisations: Civil Engineering, Research group: Track Structures
Contributors: Luomala, H.
Publication date: 29 Nov 2016

Publication information
Media of output: Rautatietekniikkaseminaari 2016, Liikennevirasto
Year: 2016
Original language: Finnish
Research output: Other contribution › Scientific

A method for design of sound insulation of glazed balconies against traffic noise

General information
Publication status: Published
MoE publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Civil Engineering, Research group: Building Acoustics, A-Insinöörit Suunnittelu Oy
Contributors: Kovalainen, V., Kylliäinen, M., Huhtala, T.
Number of pages: 8
Pages: 3834-3841
Publication date: Aug 2016

Host publication information
Title of host publication: Proceedings of the INTER-NOISE 2016, 45th International Congress and Exposition on Noise Control Engineering : Towards a Quieter Future, August 21-24, 2016, Hampburg, Germany
Place of publication: Hamburg
Publisher: German Acoustical Society (DEGA)
Article number: 503
ISBN (Electronic): 978-3-939296-11-9
ASJC Scopus subject areas: Acoustics and Ultrasonics
URLs:
http://pub.dega-akustik.de/IN2016/data/articles/000503.pdf
http://www.internoise2016.org/
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific

A method for finding suitable particle sizes for thermal conversion processes by using a simulation tool focusing on wood particle heat transfer and chemical kinetics

General information
Publication status: Published
MoE publication type: G4 Doctoral dissertation (monograph)
Organisations: Department of Chemistry and Bioengineering
Contributors: Kokko, L.
Number of pages: 124
Publication date: 2014

Publication information
Place of publication: Tampere
Publisher: Tampere University of Technology
ISBN (Print): 978-952-15-3397-6
Original language: English

Publication series
Name: Tampere University of Techology. Publication
Publisher: Tampere University of Technology
Volume: 1260
ISSN (Print): 1459-2045

Bibliographical note
Awarding institution:Tampere University of Technology
Source: researchoutputwizard
Source ID: 742
Research output: Book/Report › Doctoral thesis › Monograph

Anaerobic digestion of autoclaved and untreated food waste

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Urban circular bioeconomy (UrCirBio)
Contributors: Tampio, E., Ervasti, S., Paavola, T., Heaven, S., Banks, C., Rintala, J.
Number of pages: 8
Pages: 370-377
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Waste Management
Volume: 34
Issue number: 2
ISSN (Print): 0956-053X
Ratings:

Scopus rating (2014): CiteScore 5.9 SJR 1.763 SNIP 2.499
Original language: English
DOIs:

10.1016/j.wasman.2013.10.024

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-05-06
Publisher name: Pergamon
Source: researchoutputwizard
Source ID: 1599
Research output: Contribution to journal › Article › Scientific › peer-review

A national collaboration process: Finnish engineering education for the benefit of people and environment

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Takala, A., Korhonen-Yrjänheikki, K.
Pages: 1557-1569
Publication date: 2013
Peer-reviewed: Yes

Publication information
Journal: Science and Engineering Ethics
Volume: 19
Issue number: 4
ISSN (Print): 1353-3452
Ratings:

Scopus rating (2013): CiteScore 2.3 SJR 0.508 SNIP 1.037
Original language: English
DOIs:

10.1007/s11948-011-9330-y

Bibliographical note

online first
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 3499
Research output: Contribution to journal › Article › Scientific › peer-review

An example of exposure to magnetic fields in the home

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Österholm, L., Pääkkönen, R., Lehtelä, R., Holm, A., Korpinen, L.
Number of pages: 2
Pages: 1-2
Publication date: 2010

Host publication information
Title of host publication: Bioelectromagnetics Society 32nd Annual Meeting (BEMS), June 14-18, 2010, Seoul, Korea
URLs:

http://www.bioelectromagnetics.org/bems2010/

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 8914
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

An experimental study and numerical modeling of combusting two coal chars in a drop-tube reactor: A comparison between N2/O2, CO2/O2, and N2/CO2/O2 atmospheres

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Urban circular bioeconomy (UrCirBio)
Contributors: Tolvanen, H., Raiko, R.
Number of pages: 12
Pages: 190-201
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Fuel
Volume: 124
ISSN (Print): 0016-2361
Ratings:

Scopus rating (2014): CiteScore 5.6 SJR 1.634 SNIP 2.29
Original language: English
DOIs:

10.1016/j.fuel.2014.01.103

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-03-15
Publisher name: Elsevier Ltd
Source: researchoutputwizard
Source ID: 1638
Research output: Contribution to journal › Article › Scientific › peer-review

Anxiety vs reality – Sufficiency of battery electric vehicle range in Switzerland and Finland
Limitations of battery capacity in battery electric vehicles (BEVs) contribute to what is known as range anxiety, and therefore poses an obstacle to their mass-market adoption. While high-range BEVs have been recently introduced, it is not clear whether they will be able to cover all possible trips without long recharging detours, and what the infrastructure needs of those vehicles are. To understand the impact of range limitations in Switzerland and Finland, we constructed a simulation model that is based on representative national travel surveys. We use it to calculate the potential of BEVs to cover any trips and investigate options to increase this coverage. The options discussed in this paper are ways to facilitate easy recharging, such as infrastructure development policies. We complement our results with insights from three focus

groups. The results suggest that 85–90% of all national trips could have already been covered with BEVs prevalent in 2016. If the charging station infrastructure is developed appropriately and high-range BEVs are adopted, it is possible to reach a potential coverage of 99% or more in both countries. Deploying charging stations at users' homes and in residential areas does contribute significantly to this improvement and is desirable from a car user's perspective. Providing fast-charging stations in other locations is necessary to maximise the potential. We recommend to focus policy efforts on the development of residential charging options and to increase the visibility of electro-mobility using fast-charging stations.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Research group: Transport Research Centre Verne, Civil Engineering, ETH Zürich
Contributors: Melliger, M., van Vliet, O. P., Liimatainen, H.
Number of pages: 15
Pages: 101-115
Publication date: 23 Aug 2018
Peer-reviewed: Yes

Publication information
Journal: TRANSPORTATION RESEARCH PART D: TRANSPORT AND ENVIRONMENT
Volume: 65
ISSN (Print): 1361-9209
Ratings:

Scopus rating (2018): CiteScore 6.2 SJR 1.448 SNIP 1.996
Original language: English
Electronic versions:

1-s2.0-S1361920917310295-main
DOIs:

10.1016/j.trd.2018.08.011
URLs:

http://urn.fi/URN:NBN:fi:tty-201809032257
Research output: Contribution to journal › Article › Scientific › peer-review

Application oriented wear testing of wear resistant steels in mining industry
Tampere Wear Center have developed several high-stress wear testers that utilize large sized abrasive particles of natural origin and thus are able to
simulate demanding applications of the mining industry. In this work, a versatile high speed slurry-pot wear tester was developed. Research questions
studied are: 1) How to set up a wear test method for simulating the real applications?, 2) What are the wear mechanisms in high-stress wear?, and
3) What is the role of microstructure and chemical composition on wear performance of wear resistant steels?

The high speed slurry-pot tester was developed for application oriented erosion wear testing of materials used in mineral handling and processing. It
enables tests in demanding high-stress abrasive and erosive environments simulating wear, for example, in slurry pumps, tanks and pipes, dredging,
mineral crushing and grinding, screening, loader buckets, and rock drilling. The key design features of the test method are the possibility to use up to
10 millimeter sized large abrasives and sample speeds up to 20 m/s in conditions ranging from wet slurry environments to dry sand or gravel.

The work has been done in FIMECC DEMAPP and DIMECC BSA projects, the focus is in the application oriented wear testing of materials intended for
demanding wear related applications.

General information
Publication status: Published
Organisations: Department of Materials Science, Research group: Materials Characterization
Contributors: Ojala, N.
Publication date: Nov 2016
Peer-reviewed: Unknown
Event: Paper presented at DIMECC 9th Annual Seminar, Helsinki, Finland.
ASJC Scopus subject areas: Mechanics of Materials, Metals and Alloys, Polymers and Plastics, Industrial and Manufacturing Engineering
Keywords: Wear testing, Application oriented, Steels, Polymer, Mining, mineral processing, Field test

URLs:
https://www.researchgate.net/publication/310160912_Application_oriented_wear_testing_of_wear_resistant_steels_in_mining_industry
Research output: Other conference contribution › Paper, poster or abstract › Scientific

Appropriate pricing policy needed worldwide for improving water services infrastructure

This article highlights the enormous and growing gap between the projected and required financing of water services infrastructure, which is caused by unviable pricing and/or costrecovery regimes. Globally there is a growing funding gap in rehabilitation, renewal, and replacement of aging water infrastructure and the need for future greenfield investments. Underpricing of water services and the need for rehabilitation seem to be worldwide phenomena. There are diverse constraints in OECD (Organisation for Economic Co-Operation and Development) and non-OECD countries contributing to underpriced water services; however, the message is clear: the global water industry must stop underpricing precious water resources. Future enjoyment of sustainable water services will require customers to bear all or at least a major part of the costs. Better awareness of broader economic and social benefits of water supply, and particularly of sanitation, also will be needed.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Life Cycle Effectiveness of the Built Environment (LCE@BE)
Contributors: Hukka, J. J., Katko, T. S.
Pages: E37-E46
Publication date: 1 Jan 2015
Peer-reviewed: Yes

Publication information

Journal: Journal American Water Works Association
Volume: 107
Issue number: 1
ISSN (Print): 0003-150X
Ratings:
Scopus rating (2015): CiteScore 0.9 SJR 0.401 SNIP 0.641
Original language: English
ASJC Scopus subject areas: Water Science and Technology, Chemistry(all)
Keywords: Aging and deteriorating infrastructure, Pricing, Sustainability, Sustainable cost recovery, Underpricing, Water services infrastructure
DOIs:
10.5942/jawwa.2015.107.0007
URLs:
http://www.scopus.com/inward/record.url?scp=84920619765&partnerID=8YFLogxK (Link to publication in Scopus)
Source: Scopus
Source ID: 84920619765
Research output: Contribution to journal › Article › Scientific › peer-review

A recombinant Escherichia coli sensor strain for the detection of tetracyclines

A bioluminescent Escherichia coli K-12 strain for the specific detection of the tetracycline group of antibiotics is described, A sensor plasmid, containing five genes from bacterial luciferase operon of Photorhabdus luminescens inserted under the control of tetracycline-responsive elements of the transposon Tn10, was constructed. Usage of the full-length luciferase operon in the sensor resulted in tetracycline-dependent light production without additions, i.e., self-luminescent phenotype, since all the substrates were intrinsically produced by the recombinant organism, The time needed for optimal induction of light emission was 90 min. Maximal induction of similar to 100-fold over uninduced levels by using 20 ng of tetracycline, and picomole sensitivities for the seven different tetracyclines tested, were obtained without added Mg2+ ions. The higher the pH and the magnesium ion concentration in the assay medium the higher was the amount of membrane-impermeable tetracycline-Mg2+ chelate complex. In consequence, by adjusting the pH and the Mg2+ ion concentration, the sensitivity of the assay can be modified for different analytical purposes. Different non-tetracycline antibiotics did not cause induction of light emission.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Univ Turku, University of Turku, Dept Biotechnol, University of Turku
Contributors: Korpela, M. T., Kurittu, J. S., Karvinen, J. T., Karp, M. T.
Number of pages: 6
Pages: 4457-4462

Publication date: 1 Nov 1998
Peer-reviewed: Yes

Publication information
Journal: Analytical Chemistry
Volume: 70
Issue number: 21
ISSN (Print): 0003-2700
Original language: English
Keywords: XENORHABDUS-LUMINESCENS, EXPRESSION, ANTIMONITE, PROMOTER, ARSENITE, BACTERIA, BINDING, CLONING, GENES
DOIs:
10.1021/ac980740e
Source: WOS
Source ID: 000076839000011
Research output: Contribution to journal › Article › Scientific › peer-review

Are Finns walking the talk?: Examining the national collaboration process on engineering education for sustainable development five years later
In 2009, the National Collaboration Group for Finnish Engineering Education published a proposal for action on sustainable development (SD). The aim of this paper is to analyze how the three main universities providing engineering education have fulfilled their commitments. The study consists of interviews with key stakeholders supplemented with the analysis of documented material. It is argued that the studied universities are now committed to SD in their strategies. However, a lot of work remains to be done before the strategies are implemented and SD is integrated to all degree programmes. Recommendations for the next steps are presented.

General information
Publication status: Published
MoE publication type: D3 Professional conference proceedings
Organisations: Department of Chemistry and Bioengineering, The Education Fund
Contributors: Takala, A., Korhonen-Yrjänheikki, K.
Publication date: 1 Jun 2015

Host publication information
Title of host publication: Conference on Engineering Education for Sustainable Development (7th : 2015 : Vancouver, B.C.)
DOIs:
10.14288/1.0064702
URLs:
https://open.library.ubc.ca/cIRcle/collections/52657/items/1.0064702
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Professional

Are there environmental or agricultural benefits in using forest residue biochar in boreal agricultural clay soil?
Short-term agronomic and environmental benefits are fundamental factors in encouraging farmers to use biochar on a broad scale. The short-term impacts of forest residue biochar (BC) on the productivity and carbon (C) storage of arable boreal clay soil were studied in a field experiment. In addition, rain simulations and aggregate stability tests were carried out to investigate the potential of BC to reduce nutrient export to surface waters. A BC addition of 30 t ha^{-1} increased soil test phosphorus and decreased bulk density in the surface soil but did not significantly change pH or water retention properties, and most importantly, did not increase the yield. There were no changes in the bacterial or fungal communities, or biomasses. Soil basal respiration was higher in BC-amended plots in the spring, but no differences in respiration rates were detected in the fall two years after the application. Rain simulation experiments did not support the use of BC in reducing erosion or the export of nutrients from the field. Of the C added, on average 80% was discovered in the 0–45 cm soil layer one year after the application. Amendment of boreal clay soil with a high rate of BC characterized by a moderately alkaline pH, low surface functionalities, and a recalcitrant nature, did not induce such positive impacts that would unambiguously motivate farmers to invest in BC. BC use seems unviable from the farmer's perspective but could play a role in climate change mitigation, as it will likely serve as long-term C storage.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Research group: Computational Biophysics and Imaging Group, BioMediTech, Natural Resources Institute Finland (Luke), HAMK University of Applied Sciences
Contributors: Soinne, H., Keskinen, R., Heikkinen, J., Hyväluoma, J., Uusitalo, R., Peltoniemi, K., Velmala, S., Pennanen, T., Fritze, H., Kaseva, J., Hannula, M., Rasa, K.

Publication date: 20 Aug 2020
Peer-reviewed: Yes

Publication information
Journal: Science of the Total Environment
Volume: 731
Article number: 138955
ISSN (Print): 0048-9697
Original language: English
ASJC Scopus subject areas: Environmental Engineering, Environmental Chemistry, Waste Management and Disposal, Pollution
Keywords: Biochar, Carbon sequestration, Microbial community, Nutrient leaching, Soil productivity, Soil quality
Electronic versions:

1-s2.0-S0048969720324724-main
DOIs:

10.1016/j.scitotenv.2020.138955
URLs:

http://urn.fi/URN:NBN:fi:tuni-202007076343
Source: Scopus
Source ID: 85084456173
Research output: Contribution to journal › Article › Scientific › peer-review

Arsenic in bedrock, soil and groundwater - The first arsenic guidelines for aggregate production established in Finland
Concern over arsenic (As)-rich drinking water has gained worldwide attention since the 1990s, when the prob- lem was discovered in West Bengal in India and in Bangladesh. Since then, authorities and research institutes have focused on risk assessment and management for As in Finland. Nationwide geochemical mapping projects determined background levels and revealed regions with a higher than average As content in bedrock and soil. Approximately 10% of the citizens in Finland use drinking water from private wells. Groundwater, especially from drilled bedrock wells, may contain As concentrations higher than 10 μg/L, the European Union quality guideline for As in drinking water. Here, we present the outcome of two European Union projects, RAMAS and ASROCKS, which based their conclusions on nationwide databases and thousands of samples. Both RAMAS and ASROCKS focused on the Tampere-Häme region of Southern Finland, where bedrock and soil contain more As than in other parts of Finland on average. Over 1000 groundwater samples revealed that drilled bedrock wells may contain As-rich water in certain geological units. Naturally occurring As in bedrock and soil may also cause themobilization of As during rock aggregate production and construction activities, potentially impacting on groundwater aquifers, surface waters, and biota. Arsenic concentrations in aggregate production and con- struction exceeded the regional background levels in some bedrock and aggregate product samples, but during leaching tests As concentrations were found to be low. Based on the results, riskmanagement toolswere revised and guidelines for the rock aggregate industry were established in cooperation with authorities, companies, and other stakeholders. To our knowledge, the guidelines establishedwere the first in theworld. The guidelines for As for the aggregate and construction industries can be applied in other countries and adapted to local conditions.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Research group: Earth Constructions, Research group: Track Structures, Aalto University, Geologian tutkimuskeskus, Finnish Environment Institute
Contributors: Parviainen, A., Loukola-Ruskeeniemi, K., Tarvainen, T., Hatakka, T., Härmä, P., Backman, B., Ketola, T., Kuula, P., Lehtinen, H., Sorvari, J., Pyy, O., Ruskeeniemi, T., Luoma, S.
Number of pages: 15
Pages: 709-723
Publication date: 1 Nov 2015
Peer-reviewed: Yes

Publication information
Journal: Earth-Science Reviews
Volume: 150
ISSN (Print): 0012-8252
Ratings:

Scopus rating (2015): CiteScore 11.3 SJR 3.692 SNIP 3.143
Original language: English
ASJC Scopus subject areas: Earth and Planetary Sciences(all)
Keywords: Arsenic, Bedrock, Construction, Groundwater, Risk management, Rock aggregates, Soil, Surface water
DOIs:

10.1016/j.earscirev.2015.09.009

URLs:

http://www.scopus.com/inward/record.url?scp=84943781121&partnerID=8YFLogxK (Link to publication in Scopus)
Source: Scopus
Source ID: 84943781121
Research output: Contribution to journal › Article › Scientific › peer-review

Asiakkaat, verkostot ja henkilöstö

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Civil Engineering
Contributors: Rajala, R.
Pages: 370-491
Publication date: 2010

Host publication information
Title of host publication: Näkymätönt Porrii : Porin Veden historia
Publisher: TamPub
Editors: Juuti, P., Katko, T., Louekari, S., Rajala, R.
ISBN (Print): 978-952-5414-80-6
ISBN (Electronic): 978-951-44-8215-1
URLs:

http://urn.fi/urn:isbn:978-951-44-8215-1
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

ASROCKS-Hankkeen heikkouuttomenetelmien vertailu

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Department of Civil Engineering
Contributors: Tarvainen, T., Hatakka, T., Backman, B., Ketola, T., Härmä, P.
Number of pages: 13
Publication date: 2014

Publication information
Publisher: GEOLOGIAN TUTKIMUSKESKUS
Original language: Finnish
URLs:

http://projects.gtk.fi/export/sites/projects/ASROCKS_ENG/project/GTK_Arkistoraportti_77_2014.pdf

Bibliographical note
Contribution: organisation=rak,FACT1=1
Portfolio EDEND: 2014-12-30
Source: researchoutputwizard
Source ID: 1607
Research output: Book/Report › Commissioned report › Professional

Assessment of metabolic flux distribution in the thermophilic hydrogen producer Caloramator celer as affected by external pH and hydrogen partial pressure
Background: Caloramator celer is a strict anaerobic, alkalitolerant, thermophilic bacterium capable of converting glucose to hydrogen (H_2), carbon dioxide, acetate, ethanol and formate by a mixed acid fermentation. Depending on the growth conditions C. celer can produce H_2 at high yields. For a biotechnological exploitation of this bacterium for H_2 production it is crucial to understand the factors that regulate carbon and electron fluxes and therefore the final distribution of metabolites to channel the metabolic flux towards the desired product.Results: Combining experimental results from batch fermentations with genome analysis, reconstruction of central carbon metabolism and metabolic flux analysis (MFA), this study shed light on glucose catabolism of the thermophilic alkalitolerant bacterium C. celer. Two innate factors pertaining to culture conditions have been identified to significantly affect the metabolic flux distribution: culture pH and partial pressures of H_2 (P_{H2}). Overall, at alkaline to neutral pH the rate of biomass synthesis was maximized, whereas at acidic pH the lower growth rate and the less efficient biomass formation are accompanied with more efficient energy recovery from the substrate indicating high cell maintenance possibly to sustain intracellular pH homeostasis. Higher H_2 yields were associated with fermentation at acidic pH as a consequence of the lower synthesis of other reduced by-products such as formate and ethanol. In contrast, P_{H2} did not affect the growth of C. celer on glucose. At high P_{H2} the cellular redox state was balanced by rerouting the flow of carbon and electrons to ethanol and formate production allowing unaltered glycolytic

flux and growth rate, but resulting in a decreased H_2 synthesis.Conclusion: C. celer possesses a flexible fermentative metabolism that allows redistribution of fluxes at key metabolic nodes to simultaneously control redox state and efficiently harvest energy from substrate even under unfavorable conditions (i.e. low pH and high P_{H2}). With the H_2 production in mind, acidic pH and low P_{H2} should be preferred for a high yield-oriented process, while a high productivity-oriented process can be achieved at alkaline pH and high P_{H2}.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Tampere University of Technology, Urban circular bioeconomy (UrCirBio), Lunds Universitet / Lunds Tekniska Högskola, Lund Univ, Lund University, Department of Applied Microbiology
Contributors: Ciranna, A., Pawar, S. S., Santala, V., Karp, M., van Niel, E. W. J.
Publication date: 28 Mar 2014
Peer-reviewed: Yes

Publication information
Journal: Microbial Cell Factories
Volume: 13
Issue number: 1
Article number: 48
ISSN (Print): 1475-2859
Ratings:

Scopus rating (2014): CiteScore 7 SJR 1.757 SNIP 1.508
Original language: English
ASJC Scopus subject areas: Biotechnology, Bioengineering, Applied Microbiology and Biotechnology
Keywords: Biohydrogen production, Caloramator, Ethanol, Fermentation, Formate, Hydrogen tolerance, Metabolic flux analysis, Metabolic shift, Pyruvate node, Redox state
DOIs:

10.1186/1475-2859-13-48
URLs:

http://www.scopus.com/inward/record.url?scp=84897413447&partnerID=8YFLogxK (Link to publication in Scopus)

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-04-29
Publisher name: BioMed Central Ltd.
Source: researchoutputwizard
Source ID: 236
Research output: Contribution to journal › Article › Scientific › peer-review

Assessment of the Analytical Potential of HPLC-SEC for the Characterization of DOM and Nutrients in Various Types of Water

This study focused on high performance size exclusion liquid chromatography (HPLC-SEC) combined with two ultraviolet (UV, 254 nm and 224 nm) detection wavelengths to detect humic-like compounds and two fluorescence (FLU) excitation/emission (tyrosine-like and tryptophan-like) wavelengths to detect protein type compounds in water samples. Targeted particularly were further possibilities of this method, such as finding suitable chromatographic surrogates for organic matter and nutrient indicators for water types such as catchment surface waters, well waters, and onsite wastewater effluents, which have been studied little before. It was thus necessary to determine the optimum analytical conditions for exacting wastewater effluent analysis in term of eluent strength, eluent pH, and sample injection volume. Additionally, this study provided valuable information on the spatial and temporal behavior of dissolved organic matter along a catchment area and on the quality of onsite wastewater effluent and well water in sparsely populated areas.

A TSK-GEL G3000SW column, Na-acetate of 0.01 M at pH=7 eluent, and an injection volume of 30 µL guaranteed good separation of dissolved organic matter (DOM) in surface and well water samples up to 8 fractions and further up to 11 fractions in complex onsite black water effluents. For systematic analysis of high strength onsite wastewater effluents, we chose, based on calculations of global resolution at various eluent conditions, Na-acetate of 0.02 M at pH=7 eluent and an injection volume of 20 µL.

DOM concentration dropped along the catchment, as 35-75% of dissolved organic carbon (DOC) was eliminated. DOM in drains had up to 80% high molecular weight (HMW) fraction and lakes only 50-60% HMW. Drains had high DOC in summer and lakes in winter and spring with seasonal increase in DOC resulting from increased HMW fractions in these waters. The water treatment plant eliminated HMW fractions from raw water up to 100%, intermediate MW (IMW) fractions up to 87%, and low LMW fractions up to 66%. A seasonal increase in raw water DOM was detected in drinking water samples as increased IMW and appearance of HMW fractions. Of the two protein-type detections, tryptophan-type signals were clearly measured in surface water. Tryptophan-like FLU, as sum of peak height (SPH), was consistently higher in the drain affected by agriculture than in the drain in the mire area.

The study on well waters showed that, on average, shallow and deep well water differ little in quality in the sparsely populated agricultural areas studied. According to HPLC-SEC-UV254, high-DOC well water samples had clear and often dominant HMW fractions and low-DOC samples hardly any HMW fractions but dominant IMW fractions. The LMW fraction, correlating with nitrate, indicates anthropogenic influence. Nitrate was precisely calculated from the peak height (PH) of the LMW fraction detected by UV-224.

Our study on onsite blackwater effluent (BWE) and greywater effluent (GWE) disclosed the overall quality of onsite wastewater effluents with BWEs having higher mean values than GWEs for all the conventional indicators measured. The chromatograms (UV-254, tyrosine, and tryptophan) of onsite wastewater effluents showed the regular peaks for surface and well waters and extra peaks eluted over the permeation volume. Dividing the chromatograms into 3 regions helped identify the best possible surrogates for conventional indicators. Region 3 comprising the late peaks eluted over the permeation volume in the tyrosine- and tryptophanchromatograms correlated best with biochemical oxygen demand (BOD-7), showing that these fractions are biodegradable. Tyrosine-like chromatograms assess best DOC and BOD-7, trytophan-like chromatograms best total nitrogen (TN), and UV254 and tyrosine-like chromatograms best the chemical oxygen demand (COD) of wastewater effluents. Regression equations corresponding to the best correlations between the chromatographic and conventional indicators are given in the study for reliable calculation of DOC, COD, and BOD-7 and rough assessment of the TN.

This study highlights the fact that secondary interactions, unwanted in SEC can be exploited in nitrate measurement of well waters and BOD assessment of high strength wastewater effluents.

General information
Publication status: Published
MoE publication type: G5 Doctoral dissertation (article)
Organisations: Materials Science and Environmental Engineering
Contributors: Szabó, H. M.
Publication date: 6 Mar 2020

Publication information
Publisher: Tampere University
Volume: 224
ISBN (Print): 978-952-03-1481-1
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Original language: English

Publication series
Name: Tampere University Dissertations
Volume: 224
ISSN (Print): 2489-9860
ISSN (Electronic): 2490-0028
URLs:
http://urn.fi/URN:ISBN:978-952-03-1482-8
Research output: Book/Report › Doctoral thesis › Collection of Articles

Asset Life Cycle Management in Finnish Water Utilities

General information
Publication status: Published
MoE publication type: A2 Review article in a scientific journal
Organisations: Civil Engineering
Contributors: Rajala, R., Hukka, J.
Number of pages: 9
Pages: 587-595
Publication date: 2018
Peer-reviewed: Yes

Publication information
Journal: JOURNAL OF WATER RESOURCE AND PROTECTION
Volume: 10
Issue number: 6
ISSN (Print): 1945-3094
Original language: English
Electronic versions:
JWARP_2018062714190526
DOIs:

10.4236/jwarp.2018.106033
URLs:
http://urn.fi/URN:NBN:fi:tty-201808102062
Research output: Contribution to journal › Review Article › Scientific › peer-review

Asteittain kohti keskitettyä jätevedenpuhdistusta

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering
Contributors: Katko, T.
Pages: 312-369
Publication date: 2010

Host publication information
Title of host publication: Näkymätönt Porrii. Porin Veden historia
Editors: Juuti, P., Katko, T., Louekari, S., Rajala, R.

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 8310
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

A study of a condensing heat exchanger and electrostatic precipitator combination for small-scale wood combustion

General information
Publication status: Published
MoE publication type: D3 Professional conference proceedings
Organisations: Department of Physics, Research area: Aerosol Physics, Research area: Optics, Research group: The Instrumentation, Emissions, and Atmospheric Aerosols Group
Contributors: Grigonyte, J., Sippula, O., Tissari, J., Laitinen, A., Keskinen, J., Kortelainen, M., Lamberg, H., Jokiniemi, J.
Publication date: 2015

Host publication information
Title of host publication: European Aerosol Conference 2015 : EAC 2015, Milan, Italy
Article number: 2COA_P021

Bibliographical note
ISBN kysytty, HO.
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Professional

A study on raw, torrefied, and steam-exploded wood: Fine grinding, drop-tube reactor combustion tests in N_2/O_2 and CO_2/O_2 atmospheres, particle geometry analysis, and numerical kinetics modeling
The purpose of this study was to compare the fine grinding properties and combustion behavior of three wood pellet products: raw, torrefied, and steam-exploded wood. The energy required to fine grind the pellets was tested, and so was the geometry and size distribution of the resulting ground products. Out of all the samples the steam-exploded wood pellet required the most energy for grinding. However, it also produced more sphere-like particles compared to the other two types of samples. The combustion behavior of the samples was tested in a laminar drop-tube reactor (DTR). The samples were preground and the particles were sieved with vibration sieves with an opening of 112–125 μm. The pyrolysis process was examined separately at a temperature range of 973–1173 K. The combined pyrolysis and combustion tests were carried out at a reactor temperature of 1123 K. The O_2 concentrations used in the measurements were 3–21 vol-% in either N_2 or CO_2 atmospheres. The initial size distribution of the sample particles as well as their diameter evolution during pyrolysis and combustion was studied by using optical techniques. The surface temperature of the combusting particles was measured with a two-color pyrometer from within the DTR. The density, specific surface area, and pore diameter were measured from the ground samples with a mercury porosimeter. The chemical kinetic parameters, which describe the pyrolysis and char oxidation rates of the samples, were determined by using the data from the measurements.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Power Plant and Combustion Technology

Contributors: Tolvanen, H., Keipi, T., Raiko, R.
Pages: 153-164
Publication date: 2016
Peer-reviewed: Yes

Publication information
Journal: Fuel
Volume: 176
ISSN (Print): 0016-2361
Ratings:

Scopus rating (2016): CiteScore 7.8 SJR 1.736 SNIP 2.206
Original language: English
Keywords: Combustion, Biomass, Chemical kinetics, Carbon dioxide, Drop-tube reactor
DOIs:

10.1016/j.fuel.2016.02.071
Research output: Contribution to journal › Article › Scientific › peer-review

Atmospheric plasma enhanced hybrid barrier films through reel-to-reel process

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Nikkola, J., Mannila, J., Vartiainen, J., Tuominen, M., Nättinen, K.
Number of pages: 11
Pages: 1-11
Publication date: 2010

Host publication information
Title of host publication: ICNP-2010, Second International Conference on Natural Polymers, Bio-Polymers, Bio-Materials, their Composites, Blends, IPNs and Gels Polyelectrolytes and Gels: Macro to Nano Scales, September 24-26, 2010, Espoo, Finland

Bibliographical note
Contribution: organisation=epr pap,FACT1=1
Source: researchoutputwizard
Source ID: 8851
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Autolaskurin käyttöopas ja laskennan perusteet

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Civil Engineering, Research group: Transport Research Centre Verne, Suomen ympäristökeskus SYKE - Finnish Environment Institute, University of Helsinki
Contributors: Seppälä, J., Munther, J., Viri, R., Liimatainen, H., Weaver, S., Ollikainen, M.
Publication date: 13 Dec 2019

Publication information
Publisher: Suomen ilmastopaneeli
Volume: 11
Edition: 2019
Original language: Finnish
URLs:

https://www.ilmastopaneeli.fi/wp-content/uploads/2019/12/Ilmastopaneeli_autolaskuri_k%C3%A4ytt%C3%B6opas-ja-laskennan-perusteet_FINAL.pdf
Research output: Book/Report › Commissioned report › Professional

Bacterial community transcription patterns during a marine phytoplankton bloom
Bacterioplankton consume a large proportion of photosynthetically fixed carbon in the ocean and control its biogeochemical fate. We used an experimental metatranscriptomics approach to compare bacterial activities that route energy and nutrients during a phytoplankton bloom compared with non-bloom conditions. mRNAs were sequenced from duplicate bloom and control microcosms 1 day after a phytoplankton biomass peak, and transcript copies per litre of

seawater were calculated using an internal mRNA standard. Transcriptome analysis revealed a potential novel mechanism for enhanced efficiency during carbon-limited growth, mediated through membrane-bound pyrophosphatases [V-type H(+)-translocating; hppA]; bloom bacterioplankton participated less in this metabolic energy scavenging than non-bloom bacterioplankton, with possible implications for differences in growth yields on organic substrates. Bloom bacterioplankton transcribed more copies of genes predicted to increase cell surface adhesiveness, mediated by changes in bacterial signalling molecules related to biofilm formation and motility; these may be important in microbial aggregate formation. Bloom bacterioplankton also transcribed more copies of genes for organic acid utilization, suggesting an increased importance of this compound class in the bioreactive organic matter released during phytoplankton blooms. Transcription patterns were surprisingly faithful within a taxon regardless of treatment, suggesting that phylogeny broadly predicts the ecological roles of bacterial groups across 'boom' and 'bust' environmental backgrounds.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: The University of Tennessee, Knoxville
Contributors: Rinta-Kanto, J. M., Sun, S., Sharma, S., Kiene, R. P., Moran, M. A.
Number of pages: 12
Pages: 228-239
Publication date: Jan 2012
Peer-reviewed: Yes

Publication information
Journal: Environmental Microbiology
Volume: 14
Issue number: 1
Ratings:

Scopus rating (2012): CiteScore 10.6 SJR 3.165 SNIP 1.639
Original language: English
DOIs:

10.1111/j.1462-2920.2011.02602.x
Source: Mendeley
Source ID: fa164c9c-a2ce-339c-a2ef-5da44c537175
Research output: Contribution to journal › Article › Scientific › peer-review

Bacterial diversity and active biomass in full-scale granular activated carbon filters operated at low water temperatures
Granular activated carbon (GAC) filtration enhances the removal of natural organic matter and micropollutants in drinking water treatment. Microbial communities in GAC filters contribute to the removal of the biodegradable part of organic matter, and thus help to control microbial regrowth in the distribution system. Our objectives were to investigate bacterial community dynamics, identify the major bacterial groups, and determine the concentration of active bacterial biomass in full-scale GAC filters treating cold (3.7-9.5°C), physicochemically pretreated, and ozonated lake water. Three sampling rounds were conducted to study six GAC filters of different operation times and flow modes in winter, spring, and summer. Total organic carbon results indicated that both the first-step and second-step filters contributed to the removal of organic matter. Length heterogeneity analysis of amplified 16S rRNA genes illustrated that bacterial communities were diverse and considerably stable over time. α-Proteobacteria, β-Proteobacteria, and Nitrospira dominated in all of the GAC filters, although the relative proportion of dominant phylogenetic groups in individual filters differed. The active bacterial biomass accumulation, measured as adenosine triphosphate, was limited due to low temperature, low flux of nutrients, and frequent backwashing. The concentration of active bacterial biomass was not affected by the moderate seasonal temperature variation. In summary, the results provided an insight into the biological component of GAC filtration in cold water temperatures and the operational parameters affecting it.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Contributors: Kaarela, O. E., Härkki, H. A., Palmroth, M. R., Tuhkanen, T. A.
Number of pages: 12
Pages: 681-692
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Environmental Technology
ISSN (Print): 0959-3330
Ratings:

Scopus rating (2014): CiteScore 2.1 SJR 0.646 SNIP 0.819

Original language: English
DOIs:
10.1080/09593330.2014.958542

Bibliographical note
Published online: 22 Sep 2014
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-10-15
Publisher name: Taylor & Francis Ltd.
Source: researchoutputwizard
Source ID: 629
Research output: Contribution to journal › Article › Scientific › peer-review

Ballast bed

General information
Publication status: Published
Organisations: Civil Engineering, Research group: Track Structures
Contributors: Luomala, H.
Publication date: 24 Nov 2016

Publication information
Media of output: Presentation at Nordisk Banteknisk Ingenjörsutbildning (NBIU), Espoo
Year: 2016
Original language: English
Research output: Other contribution › Scientific

Betonielementtien uudelleenkäyttömahdollisuudet

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Department of Civil Engineering, Research group: Service Life Engineering of Structures, School of Architecture, Research group: Built Environment in Transition
Contributors: Lahdensivu, J., Huuhka, S., Annila, P., Pikkuvirta, J., Köliö, A., Pakkala, T.
Number of pages: 78
Publication date: 2015

Publication information
Place of publication: Tampere
Publisher: Tampereen teknillinen yliopisto. Rakennustekniikan laitos
ISBN (Electronic): 978-952-15-3461-4
Original language: Finnish

Publication series
Name: Tampereen teknillinen yliopisto. Rakennustekniikan laitos. Rakennetekniikka. Tutkimusraportti
Publisher: Tampereen teknillinen yliopisto. Rakennustekniikan laitos
Volume: 162
ISSN (Print): 1797-9161
Electronic versions:
lahdensivu_betonielementtien_uudelleenkayttomahdollisuudet.pdf
URLs:
http://urn.fi/URN:ISBN:978-952-15-3461-4

Bibliographical note
Contribution: organisation=rak,FACT1=1
Portfolio EDEND: 2015-03-27
Source: researchoutputwizard
Source ID: 18
Research output: Book/Report › Commissioned report › Professional

Betonirakenteiden korjausohjeet 2016, by 41

General information
Publication status: Published
MoE publication type: D5 Text book, professional manual or guide or a dictionary
Organisations: Department of Civil Engineering, Research group: Service Life Engineering of Structures, Research area: Structural Engineering

Contributors: Köliö, A., Pakkala, T., Lahdensivu, J., Pentti, M.
Number of pages: 115
Publication date: May 2016

Publication information
Publisher: Suomen Betoniyhdistys r.y.
ISBN (Print): 978-952-68068-7-7
Original language: Finnish
URLs:
https://www.rakennustietokauppa.fi/by-41-betonirakenteiden-korjausohjeet-2016-/101127/dp?nosto=alsobought
Research output: Book/Report › Book › Professional

Bilateral collaboration in municipal water and wastewater services in Finland

General information
Publication status: Published
MoE publication type: A2 Review article in a scientific journal
Organisations: Department of Chemistry and Bioengineering
Contributors: Kurki, V. O., Katko, T. S., Pietilä, P. E.
Pages: 815-825
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Water
Volume: 2
Issue number: 4
ISSN (Print): 2073-4441
Ratings:
Scopus rating (2010): SNIP 0
Original language: English
DOIs:
10.3390/w2040815

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 8494
Research output: Contribution to journal › Review Article › Scientific › peer-review

Biochars from solid digestates as sorbing materials for metal(loid)s removal from water

Sewage sludge digestate (SSD) and the organic fraction of municipal solid waste digestate (OFMSWD) are currently considered as alternative feedstocks for biochar production due to the high amount of the organic solid waste remaining at the end of the treatment. The pyrolysis of solid digestate is known as an alternative to promote the recycling of organic wastes and generate added-value bio-products (e.g. biochar). Generally, the digestate biochar has a much lower sorption capacity for metal(loid)s compared to activated carbons. Therefore, chemical treatment is considered as a potential option to improve the biochar surface properties and thus inducing a better sorption ability for metal(loid)s on the biochar surface.

In this present work, the SSD and OFMSWD derived biochars were treated with 2 M KOH or 10% H_2O_2 followed by batch washing or batch and subsequent column washings with ultrapure water. The physicochemical properties including the pH of point of zero charge (pHPZC), the Brunauer-Emmett-Teller surface area (SBET) and cation exchange capacity (CEC) were determined for all the biochars in order to link their improved surface properties to the enhanced sorption ability for metal(loid)s. All the biochars were then used to study the influence of chemical treatment and biochar washing procedure on the sorption behavior of Pb(II), Cd(II) and As(III, V) through the batch sorption kinetics and isotherms. Moreover, the As redox state distribution (i.e. As(III) and As(V)) during the As(III) sorption onto the biochar surface and in liquid solution was determined by using solid-liquid extraction followed by liquid chromatographic analysis.

Results showed increases of the pHPZC, SBET and CEC after chemical treatment of the biochar, in accordance with the enhanced sorption ability for Pb(II), Cd(II) and As(V). For instance, the maximum sorption capacity (Qm) was increased from 1.6 μmol g−1 (As(V)) and 15.4 μmol g−1 (Cd(II)) on the raw SSD biochar to 8.1 μmol g−1 (As(V)) and 306.1 μmol g−1 (Cd(II)) after the H_2O_2 and KOH treatment, respectively (at initial pH 5.0). Similarly, the Qm of Pb(II) was also increased from 31.4 μmol g^{-1} (raw SSD biochar) to 121.9 μmol g^{-1} on the H_2O_2 modified SSD biochar. However, the sorption capacity for Pb(II) was not determined after KOH treatment due to the failing of the Langmuir isotherm model to fit the experimental data. This indicates that insufficient washing of

the KOH-modified SSD biochar can hinder the Pb(II) sorption due to the release
dissolved organic compounds from this biochar that may interact with Pb2+ and thereby forming Pb-ligand complexes in the solution. In addition, the As redox distribution showed a large oxidation (70%) of As(III) to As(V) in KOH-modified SSD biochar with batch washing, while As(III) was partially oxidized (7%) in the KOH-modified SSD biochar with batch and subsequent column washings. This highlights an important role of washing procedure for sorption of metal(loid)s, particularly for Pb(II) and As(V).

The As extraction followed by liquid chromatographic analysis was successfully
established to quantitatively recover and preserve As(III) oxidation with the use of ascorbic acid. During the sorption kinetics, As(III) may be stable or partially oxidized depending on the biochar treatment. In addition, the oxidation of As(III) was strongly induced by the biochar material and to a lesser extent by the release of dissolved compounds from the biochar.

In summary, digestate biochars with the chemical treatment followed by a proper
biochar washing procedure can be successfully used as potential sorbents to enhance the Pb(II), Cd(II) and As(III, V) sorption capacity. Moreover, the determination of As redox distribution on the biochars and in liquid phase during the sorption process can be achieved through the As extraction and chromatographic analysis, providing a better understanding of the transformation between As(III) and As(V) in the biochar-liquid sorption system.

General information
Publication status: Published
MoE publication type: G5 Doctoral dissertation (article)
Organisations: Materials Science and Environmental Engineering
Contributors: Wongrod, S.
Number of pages: 79
Publication date: 23 May 2019

Publication information
Publisher: Tampere University
Original language: English

Publication series
Name: Tampere University Dissertations
URLs:

http://urn.fi/URN:NBN:fi:tuni-201906192107. Embargo ended: 23/05/20
Research output: Book/Report › Doctoral thesis › Collection of Articles

Bioenergy consumption and biogas potential in Cambodian households

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Mustonen, S., Raiko, R., Luukkanen, J.
Number of pages: 17
Pages: 1875-1892
Publication date: 2013
Peer-reviewed: Yes

Publication information
Journal: Sustainability
Volume: 5
Issue number: 5
ISSN (Print): 2071-1050
Ratings:

Scopus rating (2013): CiteScore 1.9 SJR 0.521 SNIP 1.115
Original language: English
DOIs:

10.3390/su5051875

Bibliographical note
ei vielä UT 2013-09-19
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-09-29
Publisher name: MDPI AG
Source: researchoutputwizard
Source ID: 2963

Research output: Contribution to journal › Article › Scientific › peer-review

Biofiltration of odours in dry toilet air

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Contributors: Palmroth, M. R., Kolha, V., Ramos Garcia, A., Richter, C., Crosnier, F., Perrier, L., Tuhkanen, T.
Number of pages: 7
Pages: 291-297
Publication date: 2013

Host publication information
Title of host publication: Biotechniques for air pollution control and bioenergy
Place of publication: Paris
Publisher: Presses des MINES
Editor: Malhautier, L.
ISBN (Print): 978-2-35671-058-1

Bibliographical note
Biotechniques 2013, Biotechniques for Air Pollution Control & Bioenergy, 10-13 September 2013, Nimes, France
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-10-29
Source: researchoutputwizard
Source ID: 3086
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Biogenic hydrogen and methane production from Chlorella vulgaris and Dunaliella tertiolecta biomass

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Urban circular bioeconomy (UrCirBio)
Contributors: Lakaniemi, A., Hulatt, C. J., Thomas, D. N., Tuovinen, O. H., Puhakka, J. A.
Number of pages: 12
Pages: 1-12
Publication date: 2011
Peer-reviewed: Yes

Publication information
Journal: Biotechnology for Biofuels
Volume: 4
Issue number: 1
Article number: 34
ISSN (Print): 1754-6834
Ratings:

Scopus rating (2011): CiteScore 6.3 SJR 2.239 SNIP 2.221
Original language: English
DOIs:

10.1186/1754-6834-4-34

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 6540
Research output: Contribution to journal › Article › Scientific › peer-review

Biogenic hydrogen and methane production from reed canary grass

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Urban circular bioeconomy (UrCirBio)

Contributors: Lakaniemi, A., Koskinen, P. E., Nevatalo, L. M., Kaksonen, A. H., Puhakka, J. A.
Pages: 773-780
Publication date: 2011
Peer-reviewed: Yes

Publication information
Journal: Biomass & Bioenergy
Volume: 35
Issue number: 2
ISSN (Print): 0961-9534
Ratings:

Scopus rating (2011): CiteScore 4.9 SJR 1.759 SNIP 2.306
Original language: English
DOIs:

10.1016/j.biombioe.2010.10.032

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 6541
Research output: Contribution to journal › Article › Scientific › peer-review

Biological methane oxidation in landfill cover soil - constrained by concurrent decomposition processes and sulphide oxidation?

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Contributors: Maanoja, S., Palmroth, M., Rintala, J.
Number of pages: 8
Pages: 65-72
Publication date: 2013

Host publication information
Title of host publication: Biotechniques for air pollution control and bioenergy
Place of publication: Paris
Publisher: Presses des MINES
Editor: Luc, M.
ISBN (Print): 978-2-35671-058-1

Bibliographical note
Biotechniques 2013, Biotechniques for Air Pollution Control & Bioenergy, 10-13 September 2013, Nimes, France
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-10-29
Source: researchoutputwizard
Source ID: 2841
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Biological Nitrogen Removal from Acidic, Heavy-metal Containing Waters

General information
Publication status: Published
MoE publication type: G5 Doctoral dissertation (article)
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Contributors: Zou, G.
Number of pages: 92
Publication date: 2015

Publication information
Place of publication: Tampere
Publisher: Tampere University of Technology

ISBN (Print): 978-952-15-3558-1
Original language: English

Publication series
Name: Tampere University of Technology. Publication
Publisher: Tampere University of Technology
Volume: 1314
ISSN (Print): 1459-2045

Bibliographical note
Awarding institution:Tampere University of Technology
Research output: Book/Report › Doctoral thesis › Collection of Articles

Bioprocessing of enhanced cellulase production from a mutant of Trichoderma asperellum RCK2011 and its application in hydrolysis of cellulose

A mutant strain of Trichoderma asperellum RCK2011 was developed through UV-irradiation for enhanced cellulase production and lower catabolite repression. The production of FPase, CMCase and β-glucosidase was optimized under solid state fermentation; up to 20 mM of glucose did not inhibit cellulase production. The mutant strain T. asperellum SR1-7 produced FPase (2.2 IU/gds), CMCase (13.2 IU/gds), and β-glucosidase (9.2 IU/gds) under optimized conditions, which is, 1.4, 1.3, 1.5-fold higher than the wild type. The wild as well as mutant strain produced the cellulases at pH range, 4.0-10.0. Saccharification of pretreated corn cob, wheat straw, and sugarcane bagasse by cellulase from mutant strain SR1-7 resulted in release of reducing sugar at the rate of 530.0 mg/g, 290.0 mg/g, and 335.0 mg/g of substrate, respectively; this is 1.6-fold higher than the wild type strain. © 2014 Published by Elsevier Ltd.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Tampere University of Technology, Urban circular bioeconomy (UrCirBio), Department of Microbiology , University of Delhi South Campus, Lignocellulose Biotechnology Laboratory
Contributors: Raghuwanshi, S., Deswal, D., Karp, M., Kuhad, R. C.
Number of pages: 7
Pages: 183-189
Publication date: 15 May 2014
Peer-reviewed: Yes

Publication information
Journal: Fuel
Volume: 124
ISSN (Print): 0016-2361
Ratings:
Scopus rating (2014): CiteScore 5.6 SJR 1.634 SNIP 2.29
Original language: English
ASJC Scopus subject areas: Fuel Technology, Energy Engineering and Power Technology, Chemical Engineering(all), Organic Chemistry
Keywords: Alkaline cellulase, Catabolite repression, Saccharification, Solid state fermentation
DOIs:
10.1016/j.fuel.2014.01.107
URLs:
http://www.scopus.com/inward/record.url?scp=84894571819&partnerID=8YFLogxK (Link to publication in Scopus)

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-03-15
Source: researchoutputwizard
Source ID: 1327
Research output: Contribution to journal › Article › Scientific › peer-review

Biovalorisation of liquid and gaseous effluents of oil refinery and petrochemical industry

Liquid effluents of oil refinery contain toxic selenium oxyanions and phenol, while gaseous effluents contain toxic CO/syngas. To remove the phenol and simultaneously reduce the selenite oxyanions, a fungal-bacterial co-culture of Phanerochaete chrysosporium and Delftia lacustris was developed. Two modes of co-cultures of the fungus and the bacterium were developed. The first being a freely growing bacterium and fungus (suspended growth co-culture), the second being the growth of the bacterial biomass encircling the fungal biomass
(attached growth co-culture). Both types of fungal-bacterial co-cultures were incubated with varying concentrations of phenols with a fixed selenite concentration (10 mg/L). The suspended growth co-culture could degrade up to 800 mg/L of

phenol and simultaneously reduce 10 mg/L of selenite with production of nano Se(0) having a minimum diameter of 3.58 nanometer. The attached growth co-culture could completely degrade 50 mg/L of phenol and simultaneously reduce selenite to nano Se(0) having a minimum diameter of 58.5 nm.

In order to valorize the CO/syngas by bioconversion techniques an anaerobic methanogenic sludge was acclimatized to use CO as sole carbon substrate for a period of 46 days in a continuous stirred stank reactor, supplied with CO at 10 ml/min. 6.18g/L acetic acid, 1.18g/L butyric acid, and 0.423g/L hexanoic acid were the highest concentrations of metabolites produced. Later, acids were metabolized at lower pH, producing alcohols at concentrations of 11.1g/L ethanol, 1.8g/L butanol and 1.46g/L hexanol, confirming the successful enrichment strategy. The next experiment focused on the absence of trace element tungsten, and consecutively selenium on the previously CO acclimatized sludge under the same operating conditions. An in-situ synthesized co-polymeric gel of N-ter-butyl-acrylamide and acrylic acid was used to recover ethanol, propanol and butanol from a synthetic fermentation broth. The scope of repeated use of the gel for the alcohol recovery was investigated and every time
approximately 98% alcohol was recovered.

General information
Publication status: Published
MoE publication type: G5 Doctoral dissertation (article)
Organisations: Materials Science and Environmental Engineering
Contributors: Chakraborty, S.
Number of pages: 211
Publication date: 12 Dec 2019

Publication information
Publisher: Tampere University
Original language: English

Publication series
Name: Tampere University Dissertations
URLs:

http://urn.fi/URN:NBN:fi:tuni-202001141235. Embargo ended: 12/12/20
Research output: Book/Report › Doctoral thesis › Collection of Articles

Birth and expansion of public water supply and sanitation in Finland until World War II

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P., Katko, T.
Pages: 117-130
Publication date: 2007

Host publication information
Title of host publication: Environmental History of Water - Global views on community water supply and sanitation
Editors: Juuti, P., Katko, T., Vuorinen, H.

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14486
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Book Review: Graham, S. (Ed.), Disrupted Cities: When Infrastructure Fails

General information
Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Department of Chemistry and Bioengineering
Contributors: Katko, T.
Publication date: 2010
Peer-reviewed: No

Publication information
Journal: Public Works Management & Policy, Vol. 14, Nr 4, April 2010

Original language: English

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 8309
Research output: Contribution to journal › Article › Scientific

Book review : Oestigaard, T. 2013. Water, Christianity and the rise of capitalism. London, New York: I.B. Tauris. ISBN 978-1-78076-066-7, 209 pages

General information
Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Department of Chemistry and Bioengineering
Contributors: Katko, T. S.
Number of pages: 2
Pages: 273-274
Publication date: 2014
Peer-reviewed: No

Publication information
Journal: Water Alternatives
Volume: 7
Issue number: 1
Ratings:

Scopus rating (2014): CiteScore 3.3 SJR 1.117 SNIP 1.422
Original language: English
URLs:

http://www.water-alternatives.org/

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-02-15
Publisher name: Water Alternatives Association
Source: researchoutputwizard
Source ID: 678
Research output: Contribution to journal › Article › Scientific

Book Review: Time for Customer Orientation in Water Utilities Customer experience management for water utilities. Marketing urban water supply

General information
Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Research group: Capacity Development of Water and Environmental Services CADWES, Civil Engineering
Contributors: Katko, T. S., Rajala, R. P.
Pages: 228-230
Publication date: 2019
Peer-reviewed: No

Publication information
Journal: Public Works Management & Policy
Volume: 24
Issue number: 2
ISSN (Print): 1087-724X
Ratings:

Scopus rating (2019): CiteScore 1.9 SJR 0.448 SNIP 1.183
Original language: English
DOIs:

10.1177/1087724X18820014
Research output: Contribution to journal › Literature review › Scientific

Calculation of Induced Electric Fields in Human Models Exposed to ELF Magnetic and Electric Fields

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Tarao, H., Hayashi, N., Korpinen, L., Matsumoto, T., Isaka, K.
Pages: 44-44
Publication date: 2011

Host publication information
Title of host publication: ISH 2011, 17th International Symposium on High Voltage Engineering, August 22-26, 2011, Hannover, Germany
Place of publication: Hannover
Publisher: Leibnitz Universität Hannover
Editors: Gockenbach, E., Eichler, C., Mohsen, F., Fischer, M., Gratz, O., Pham, K., Zhang, X.
ISBN (Print): 978-3-8007-3364-4

Publication series
Name: International Symposium on High Voltage Engineering ISH
Publisher: Leibnitz Universität Hannover

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 7360
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Carbazole-based small molecule electron donors: Syntheses, characterization, and material properties

Efficient synthetic methods for carbazole-based small molecule electron donors with donor–acceptor (D–A) and A–D–A type structures were developed. In order to study the relation between chemical structures and material properties, the prepared compounds were characterized in detail using absorption spectroscopy, differential pulse voltammetry, and computational methods. In addition, symmetrical A–D–A type compounds were tested as an active layer component in bulk heterojunction based organic solar cell (OSC) devices with conventional structure. The results show that the two compound types have many similar properties. However, the extended molecular structure of A–D–A type compounds offer better film forming properties and higher molar absorption coefficients compared with the D–A type materials. Furthermore, the attachment of fluoro substituents in the A units has a positive effect on all solar cell device parameters. Moreover, the computational studies revealed that the molecular structures are twisted between the central carbazole D unit and π-bridge which may result in inefficient intramolecular charge transfer and, also, relatively limited short-circuit currents in OSC devices.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Chemistry and Bioengineering, Research group: Supramolecular photochemistry, Research group: Chemistry & Advanced Materials, Research Unit of Sustainable Chemistry, IMEC PV Department
Contributors: Sippola, R. J., Hadipour, A., Kastinen, T., Vivo, P., Hukka, T. I., Aernouts, T., Heiskanen, J. P.
Number of pages: 10
Pages: 79-88
Publication date: 8 Nov 2017
Peer-reviewed: Yes
Early online date: 8 Nov 2017

Publication information
Journal: Dyes and Pigments
Volume: 150
Article number: j.dyepig.2017.11.014
ISSN (Print): 0143-7208
Ratings:

Scopus rating (2017): CiteScore 5.6 SJR 0.819 SNIP 1.009
Original language: English
ASJC Scopus subject areas: Chemistry(all), Energy(all)
Keywords: Absorption, DFT, Electron donor, Organic solar cell, Suzuki-Miyaura, Synthesis
Electronic versions:

Carbazole-based small molecule electron donors 2017. Embargo ended: 8/11/19
DOIs:
10.1016/j.dyepig.2017.11.014
URLs:
http://urn.fi/URN:NBN:fi:tuni-202002132062. Embargo ended: 8/11/19
Research output: Contribution to journal › Article › Scientific › peer-review

Cardiac Pacemakers in Electric and Magnetic Fields of 400-kV Power Lines

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L., Kuisti, H., Elovaara, J., Virtanen, V.
Pages: 422-430
Publication date: 2012
Peer-reviewed: Yes

Publication information
Journal: PACE: Pacing and Clinical Electrophysiology
Volume: 35
Issue number: 4
ISSN (Print): 0147-8389
Ratings:
Scopus rating (2012): CiteScore 3 SJR 1.197 SNIP 0.908
Original language: Finnish
DOIs:
10.1111/j.1540-8159.2011.03327.x

Bibliographical note
Contribution: organisation=epr,FACT1=1
Publisher name: Wiley-Blackwell Publishing, Inc.
Source: researchoutputwizard
Source ID: 4531
Research output: Contribution to journal › Article › Scientific › peer-review

Career paths of experts on water supply and sanitation services

General information
Publication status: Published
MoE publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Chemistry and Bioengineering
Contributors: Takala, A. J.
Number of pages: 6
Pages: 1-6
Publication date: 2012

Host publication information
Title of host publication: YWPC2012, 6th IWA International Conference for Young Water Professionals, (IWA YWPC 2012), 10-13 July 2012, Budapest, Hungary. Conference Proceedings
Publisher: IWA, International Water Association; Hungarian Water Utility Association
Article number: IWA-9929

Publication series
Name: International YWP Conference
URLs:
http://www.iwa-ywpc.org/

Bibliographical note
ei ut-numeroa 30.8.2013
Contribution: organisation=keb bio,FACT1=1
Publisher name: IWA, International Water Association; Hungarian Water Utility Association
Source: researchoutputwizard
Source ID: 5388
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific

Catalytic effect of Ca and K on CO2 gasification of spruce wood char

Gasification is one route to produce chemicals and liquid fuels from biomass. The gasification of the char is catalyzed by alkali and alkaline earth metals in the biomass. In this work the catalytic effect of calcium (Ca) and potassium (K) on CO_2 gasification of spruce wood was studied using a thermo gravimetric analyzer (TGA). The ash-forming elements were first removed from the wood using an acid leaching method. Then, various concentrations of K and Ca were absorbed to the wood by ion-exchange to carboxylic and phenolic groups, impregnation of K_2CO_3 or physically mixing of CaC_2O_4. The prepared spruce samples were placed in a mesh holder and gasified in the TGA at 850°C in 100% CO_2. The results demonstrate that the gasification rate of the char increased linearly with an increase in the concentration of Ca or K. Crystalline CaC_2O_4 distributed only at the surface of the wood particles resulted in low catalytic activity. The catalytic activity of Ca was higher than K in the beginning of char gasification but the catalytic effect of Ca decreased earlier than the catalytic effect of potassium. Further, the char structure was investigated by SEM-EDX. The SEM analysis from interrupted gasification experiments showed the formation of $CaCO_3$ and K_2CO_3 layer on the char surface. By adding corresponding levels of Ca and K as the original spruce to the acid washed sample, a similar gasification reactivity was obtained at 850 °C.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Urban circular bioeconomy (UrCirBio), Abo Akademi University, Åbo Akademi University, University of Jyväskylä, Process Chemistry Center, VTT Technical Research Centre of Finland
Contributors: Perander, M., DeMartini, N., Brink, A., Kramb, J., Karlström, O., Hemming, J., Moilanen, A., Konttinen, J., Hupa, M.
Number of pages: 9
Pages: 464-472
Publication date: 15 Jun 2015
Peer-reviewed: Yes

Publication information

Journal: Fuel
Volume: 150
ISSN (Print): 0016-2361
Ratings:

Scopus rating (2015): CiteScore 6.9 SJR 1.781 SNIP 2.111
Original language: English
ASJC Scopus subject areas: Fuel Technology, Energy Engineering and Power Technology, Chemical Engineering(all), Organic Chemistry
Keywords: Biomass, Calcium, Char reactivity, CO, Gasification, Potassium
DOIs:

10.1016/j.fuel.2015.02.062
URLs:

http://www.scopus.com/inward/record.url?scp=84924100908&partnerID=8YFLogxK (Link to publication in Scopus)

Bibliographical note

EXT="Kramb, J."
Source: Scopus
Source ID: 84924100908
Research output: Contribution to journal › Article › Scientific › peer-review

CFD Based Modelling for Predicting Fouling and Corrosion in Kraft Recovery Boilers

General information

Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering, Research group: Power Plant and Combustion Technology
Contributors: Leppänen, A., Välimäki, E., Oksanen, A.
Pages: 1033-1040
Publication date: 2011

Host publication information

Title of host publication: 19th European Biomass Conference and Exhibition, 6-10 June 2011, Berlin Germany
Place of publication: Berlin

Publisher: European Biomass Conference and Exhibition
ISBN (Print): 978-88-89407-55-7

Publication series
Name: European Biomass Conference and Exhibition
Publisher: European Biomass Conference and Exhibition
DOIs:
10.5071/19thEUBCE2011-OA10.3
URLs:
http://www.conference-biomass.com

Bibliographical note
ei ut-numeroa 5.4.2014
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 6598
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

CFD-modeling of fume formation in kraft recovery boilers
A computational fluid dynamics (CFD) model was developed to simulate alkali metal chemistry and fume particle formation in a kraft recovery boiler. The modeling results were partially validated against previously obtained field measurements. The model provides information about fume composition, chlorine and potassium enrichment factors, and particle mass concentration at different locations in the boiler.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Power Plant and Combustion Technology, Urban circular bioeconomy (UrCirBio), Valmet Technologies Oy, University of Toronto, Canada
Contributors: Leppänen, A., Välimäki, E., Oksanen, A., Tran, H.
Number of pages: 8
Pages: 25-32
Publication date: 2013
Peer-reviewed: Yes

Publication information
Journal: TAPPI Journal
Volume: 12
Issue number: 3
ISSN (Print): 0734-1415
Ratings:
Scopus rating (2013): SJR 0.425 SNIP 0.651
Original language: English
URLs:
http://www.tappi.org/Publications/TJ.aspx

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-06-29
Publisher name: TAPPI
Source: researchoutputwizard
Source ID: 2768
Research output: Contribution to journal › Article › Scientific › peer-review

CFD-Modeling of Fume Formation in Kraft Recovery Boilers

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering, Research group: Power Plant and Combustion Technology, Urban circular bioeconomy (UrCirBio), Valmet Technologies Oy, University of Toronto, Canada
Contributors: Leppänen, A., Välimäki, E., Oksanen, A., Tran, H.
Publication date: 2012

Host publication information
Title of host publication: TAPPI PEERS Conference Proceedings 14.-18.10.2012, Savannah, USA
Publisher: TAPPI

Publication series
Name: TAPPI PEERS Conference
URLs:
http://www.tappi.org/Downloads/Conference-Papers/2012/2012-PEERS-Conference/12PEERS38.aspx

Bibliographical note
ei ut-numeroa 21.8.2013
Contribution: organisation=epr,FACT1=1
Publisher name: TAPPI
Source: researchoutputwizard
Source ID: 4695
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Challenges to Finnish water and wastewater services in the next 20-30 years

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Life Cycle Effectiveness of the Built Environment (LCE@BE)
Contributors: Heino, O. A., Takala, A. J., Katko, T. S.
Number of pages: 20
Pages: 1-20
Publication date: 2011
Peer-reviewed: Yes

Publication information
Journal: E-Water
Article number: 2011/01
ISSN (Print): 1994-8549
Ratings:
Scopus rating (2011): SJR 0.172 SNIP 0.669
Original language: English

Bibliographical note
Lehden sivuilla mainittu: Prior to publication, proposed articles are reviewed by two referees from a network of European experts who form the Communication Committee of the EWA.Ei UT-numeroa 8.3.2014
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 6062
Research output: Contribution to journal › Article › Scientific › peer-review

Changing energy production structures and CO2 emissions in the ASEAN countries: Decomposition analysis of drivers behind the changes

General information
Publication status: Published
MoE publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Energy and Process Engineering
Contributors: Vehmas, J., Luukkanen, J., Mustonen, S., Kaivo-oja, J., Snäkin, J., Jusi, S.
Pages: 5 p
Publication date: 2008

Host publication information
Title of host publication: International Conference on Energy Security and Climate Change: Issues, Strategies, and Options (ESCC 2008). 6-8 August 2008, Bangkok, Thailand

Bibliographical note
Conference Proceedings CD-Rom
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 13746
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific

Characteristics and agronomic usability of digestates from laboratory digesters treating food waste and autoclaved food waste

Digestate characteristics such as organic and nutrient content, hygienic quality and stability are valuable measures when evaluating the use of food waste (FW) digestate as organic fertiliser. This study compared the characteristics of FW and autoclaved (160 °C, 6.2 bar) FW and their digestates from laboratory-scale reactors. Decreased ammonification and low

ammonium nitrogen content were observed in the digestate from an autoclaved FW reactor due to autoclave treatment of FW, which affected the nitrogen-containing molecules by formation of Maillard compounds. The methane potential of autoclaved FW and its digestate was decreased by 40% due to reduced microbial activity as microbes were not able to adapt to the conditions within a reactor fed with autoclaved FW. Both studied materials were suitable for agricultural use in terms of their nutrient content, hygienic quality and stability, and thus the decrease in ammonium nitrogen in digestate from an autoclaved FW reactor supported the use of digestate as soil amendment rather than fertiliser.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Urban circular bioeconomy (UrCirBio), Natural Resources Institute Finland (Luke)
Contributors: Tampio, E., Ervasti, S., Rintala, J.
Number of pages: 7
Pages: 86-92
Publication date: 1 May 2015
Peer-reviewed: Yes

Publication information
Journal: Journal of Cleaner Production
Volume: 94
ISSN (Print): 0959-6526
Ratings:

Scopus rating (2015): CiteScore 6.8 SJR 1.635 SNIP 2.396
Original language: English
ASJC Scopus subject areas: Industrial and Manufacturing Engineering, Renewable Energy, Sustainability and the Environment, Environmental Science(all), Strategy and Management
Keywords: Ammonium nitrogen, Autoclave treatment, Characterisation, Digestate, Fertiliser, Food waste
DOIs:

10.1016/j.jclepro.2015.01.086
URLs:

http://www.scopus.com/inward/record.url?scp=84928768890&partnerID=8YFLogxK (Link to publication in Scopus)

Bibliographical note
EXT="Tampio, Elina"
Source: Scopus
Source ID: 84928768890
Research output: Contribution to journal › Article › Scientific › peer-review

Characterization and biological stabilization of fine fraction from landfill mining
Landfilling has been the major method to dispose waste for the decades, thus there are thousands of landfills around the world. Landfills contain large amount of resources, which could be used as material or energy. There is an increasing interest for landfill mining which means excavation and processing of waste materials mined from landfills. While previous landfill composition studies have focused especially on metal recovery and combustible materials, they have shown that landfills contain significant amounts of soil type material with small particle size, referred as fine fraction (FF). As redisposal of FF after landfill mining is expensive and causes emissions for decades, FF should be treated to increase value for reuse. The aim of this thesis was to assess in details the characteristics of the FF and to evaluate the effects of different biological treatment methods on stability and characteristics of FF. In this study, FF was sampled from two landfills representing different eras of material consumption and waste management practices: Kuopio, landfilled 2001–2011, and Lohja, landfilled 1967–1989.

The Kuopio landfill was found to contain 38–54 % of FF (< 20 mm) and the Lohja landfill 40–74%. FF contains in various amounts of organic matter (VS 6–27% of TS), nutrients (1.4–8 kg N/t TS, 1–1.5 kg P/t TS) and soluble organic compounds (e.g. 0.5–4.6 kg COD/t TS). The organic matter content, biomethane potential (0.4–27 L CH4/kg TS) and respiration activity (1.4–2.4 g O2/kg TS) were detected to be higher in top layer of new landfill (1–5 years old) while bottom layer of new landfill (6–10 years old) was similar to old landfill (24–46 years old). Biological activity may limit the utilization of FF after landfill mining, thus FF needs to be stabilized to reduce biological activity. Furthermore, FF may also contain hazardous compounds, which needs to be assessed when evaluating the use of FF.

To reduce biological activity of FF, the anaerobic and aerobic stabilization of FF were studied in two laboratory experiments employing simultaneous four leach bed reactors operated for 173–180 days. In anaerobic stabilization, methane production was found to range from 9 to 18 m3 CH4/t VS for FFs from both landfills. Irrigation of FF was necessary for efficient methane production while sludge addition providing both moisture and inoculum deteriorated the characteristics of FF.

Aerobic stabilization reduced more efficiently organic matter content and biological activity from FF compared with

anaerobic treatment. Ammonium nitrogen in the leachate was removed rapidly in aerobic treatment due to nitrification. Organic matter and soluble compounds were efficiently removed with continuous water adding, regardless of anaerobic and aerobic conditions, while leachate recirculation introduced those back to the reactor. The scaling up of the anaerobic and aerobic stabilization methods of FF showed that applied technology, for example aeration or irrigation method, and size of treatment area have major effects on the costs of FF treatment. However, anaerobic stabilization and aerobic stabilization with passive aeration without continuous irrigation would have similar costs in similar sites.

In conclusion, FF may need stabilization due to organic matter content and biological activity before utilization. Both anaerobic and aerobic stabilization improved the quality of FF by reducing organic matter content and biological activity. Both treatment methods can be used in full scale stabilization of FF. The treatment of FF has potential to increase the value and usability of FF. Treatment concept and technology should be further optimized in pilot and full scales.

General information
Publication status: Published
MoE publication type: G5 Doctoral dissertation (article)
Organisations: Chemistry and Bioengineering
Contributors: Mönkäre, T.
Number of pages: 68
Publication date: 23 Feb 2018

Publication information
Publisher: Tampere University of Technology
ISBN (Print): 978-952-15-4077-6
ISBN (Electronic): 978-952-15-4087-5
Original language: English

Publication series
Name: Tampere University of Technology. Publication
Volume: 1522
ISSN (Print): 1459-2045
Electronic versions:

monkare 1522
URLs:

http://urn.fi/URN:ISBN:978-952-15-4087-5
Research output: Book/Report › Doctoral thesis › Collection of Articles

Characterization of fine fraction from landfill mining for evaluating methane potential

General information
Publication status: Published
MoE publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Chemistry and Bioengineering
Contributors: Mönkäre, T., Palmroth, M., Rintala, J.
Publication date: 2014

Host publication information
Title of host publication: Fifth International Symposium on Energy from Biomass and Waste, Venice 2014 Proceedings, Island of San Servolo, Venice, Italy, 17-20 November 2014
Place of publication: Italy
Publisher: CISA Publisher
ISBN (Print): 978-88-6265-085-4

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-12-12
Publisher name: CISA Publisher
Source: researchoutputwizard
Source ID: 1098
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific

Characterization of fine fraction mined from two Finnish landfills

A fine fraction (FF) was mined from two Finnish municipal solid waste (MSW) landfills in Kuopio (1- to 10-year-old, referred as new landfill) and Lohja (24- to 40-year-old, referred as old landfill) in order to characterize FF. In Kuopio the FF (<20mm) was on average 45±7% of the content of landfill and in Lohja 58±11%. Sieving showed that 86.5±5.7% of the FF was smaller than 11.2mm and the fraction resembled soil. The total solids (TS) content was 46-82%, being lower in the bottom layers compared to the middle layers. The organic matter content (measured as volatile solids, VS) and the biochemical methane potential (BMP) of FF were lower in the old landfill (VS/TS 12.8±7.1% and BMP 5.8±3.4m^3 CH_4/t TS) than in the new landfill (VS/TS 21.3±4.3% and BMP 14.4±9.9m^3 CH_4/t TS), and both were lower compared with fresh

MSW. In the Kuopio landfill materials were also mechanically sieved in the full scale plant in two size fraction <30mm (VS/TS 31.1% and 32.9m^3 CH_4/t TS) and 30-70mm (VS/TS 50.8% and BMP 78.5m^3 CH_4/t TS). The nitrogen (3.5±2.0g/kg TS), phosphorus (<1.0-1.5g/kg TS) and soluble chemical oxygen demand (COD) (2.77±1.77kg/t TS) contents were low in all samples. Since FF is major fraction of the content of landfill, the characterization of FF is important to find possible methods for using or disposing FF mined from landfills.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Contributors: Mönkäre, T. J., Palmroth, M. R. T., Rintala, J. A.
Number of pages: 6
Pages: 34-39
Publication date: 2016
Peer-reviewed: Yes

Publication information
Journal: Waste Management
Volume: 47A
ISSN (Print): 0956-053X
Ratings:

Scopus rating (2016): CiteScore 6.4 SJR 1.407 SNIP 2.191
Original language: English
ASJC Scopus subject areas: Waste Management and Disposal
Keywords: Biochemical methane potential, Characterization, Fine fraction, Landfill mining, Municipal solid waste
Electronic versions:

Mönkäre et al. 2016. Embargo ended: 1/12/17
DOIs:

10.1016/j.wasman.2015.02.034
URLs:

http://urn.fi/URN:NBN:fi:tty-201903261332. Embargo ended: 1/12/17
Source: Scopus
Source ID: 84958845557
Research output: Contribution to journal › Article › Scientific › peer-review

Chasing measurements for real-world emissions of city buses

General information
Publication status: Published
Organisations: Physics, Research area: Aerosol Physics, Research group: The Instrumentation, Emissions, and Atmospheric Aerosols Group, Atmospheric Composition Research, Finnish Meteorological Institute, Helsinki Region Environmental Services Authority (HSY), Department of Environmental Sciences, Helsinki University
Contributors: Järvinen, A., Karjalainen, P., Bloss, M., Potila, O., Simonen, P., Kuuluvainen, H., Timonen, H., Saarikoski, S. , Niemi, J. V., Keskinen, J., Rönkkö, T.
Publication date: 2017
Peer-reviewed: Unknown
Event: Paper presented at European Aerosol Conference 2017, Zürich, Switzerland.
ASJC Scopus subject areas: Automotive Engineering, Pollution, Energy (miscellaneous)
Keywords: Exhaust emissions, bus emissions, Air quality
Research output: Other conference contribution › Paper, poster or abstract › Scientific

CO2 reduction costs and benefits in transport: socio-technical scenarios
The transport sector produces 23% of greenhouse gas (GHG) emissions globally. While the mitigation of climate change requires GHG emissions to be drastically reduced, the emissions from the transport sector are expected to grow. The purpose of this study is to produce alternative scenarios which meet the target of 80% CO2 emission reduction by 2050 for the Finnish transport sector and to analyse the carbon abatement potentials, costs and benefits of the required behavioural and technological measures. We found that the most cost-efficient measure for the society is to support a shift from private car use to shared car use through increasing car-sharing and ride-sharing. Aiming to reach the emission reduction targets solely through technological measures would require a rapid uptake of alternative energies and the society would not receive the possible benefits, including health benefits, energy savings and fixed car cost savings.

General information
Publication status: Published

MoE publication type: A1 Journal article-refereed
Organisations: Research group: Transport Research Centre Verne, Civil Engineering
Contributors: Liimatainen, H., Pöllänen, M., Viri, R.
Number of pages: 12
Publication date: 21 Dec 2018
Peer-reviewed: Yes

Publication information
Journal: European Journal of Futures Research
Volume: 2018
Issue number: 6:22
ISSN (Print): 2195-4194
Ratings:

Scopus rating (2018): CiteScore 0.3 SJR 0.13 SNIP 0.119
Original language: English
Keywords: Transport, GHG emissions, Emission reduction, Costs, Benefits, Scenarios
Electronic versions:

Liimatainen2018_Article_CO2ReductionCostsAndBenefitsIn
DOIs:

10.1186/s40309-018-0151-y
URLs:

http://urn.fi/URN:NBN:fi:tty-201901081031
Research output: Contribution to journal › Article › Scientific › peer-review

Coal char combustion in O2/N2 and O2/CO2 conditions in a drop tube reactor: an optical study

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering, Urban circular bioeconomy (UrCirBio)
Contributors: Rodriguez Avila, M., Honkanen, M., Raiko, R., Oksanen, A.
Number of pages: 22
Pages: 1-22
Publication date: 2012
Peer-reviewed: Yes

Publication information
Journal: Industrial Combustion
Article number: 201201
ISSN (Print): 2075-3071
Ratings:

Scopus rating (2012): CiteScore 0.4 SJR 0.14 SNIP 0.183
Original language: English
URLs:

http://www.journal.ifrf.net/paper_download.html?paperId=96

http://www.industrial.combustion.ifrf.net/index.html

Bibliographical note
ei ut-numeroa 29.8.2013
Contribution: organisation=epr,FACT1=1
Publisher name: International Flame Research Foundation, IFRF
Source: researchoutputwizard
Source ID: 5185
Research output: Contribution to journal › Article › Scientific › peer-review

Combining mineral fractions of recovered MSWI bottom ash: improvement for utilization in civil engineering structures

In real-life construction projects, the utilization of different types of waste derived aggregates can often be falsely considered as utilization, but in fact, it is merely dumping the potentially high value material from one site to another. For example, building highway noise barriers with waste derived aggregates cannot be considered as utilization. In this study, a more advanced approach was chosen in order to create aggregate like products from recovered municipal solid waste incineration (MSWI) bottom ash (BA) and thus potentially increase their value and image in civil engineering applications. MSWI BA from one waste incineration plant in Finland was first treated with a Dutch dry treatment technology called ADR (Advanced Dry Recovery). This process separates non-ferrous and ferrous metals from MSWI BA and generates mineral fractions of different grain sizes. These mineral fractions may not be used separately, for example, in the unbound structural layers of roads due to the strict grain size distribution requirements of these civil engineering structures. Hence,

different combinations were designed from these BA mineral fractions using the mathematical proportioning of aggregates. The aim was to create aggregate like products from this waste material for different structural layers (filtration, sub-base and base) of, for example, road and field structures. Three mixtures were chosen based on their correspondence to the grain size distribution requirements of natural aggregates and further analyzed in the laboratory from their technical, mechanical and environmental point of view. The leaching of chrome (Cr) and chloride (Cl-) exceeded the Finnish emission boundary values for utilization of certain types of ashes in civil engineering. On the other hand, the technical and mechanical properties of these mixed bottom ash products were considered suitable to be used, for example, in the unbound structural layers of the interim storage field in a waste treatment center. In such location, also the leaching potential of harmful substances can be further studied and verified in a larger scale.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Research group: Earth Constructions, Research area: Infrastructure Construction, Suomen Erityisjäte Oy
Contributors: Sormunen, L. A., Kalliainen, A., Kolisoja, P., Rantsi, R.
Number of pages: 12
Publication date: 22 Aug 2016
Peer-reviewed: Yes

Publication information
Journal: Waste and Biomass Valorization
ISSN (Print): 1877-2641
Ratings:
Scopus rating (2016): CiteScore 2.1 SJR 0.451 SNIP 0.668
Original language: English
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URLs:
http://www.readcube.com/articles/10.1007/s12649-016-9656-4?author_access_token=NZQ_65zpzbVOVrBLEzMHEve4RwlQNchNByi7wbcMAY7GR4lWoCqPWPkZkNDQXRz7x_qbW1ahjf7kWiQeH17QihXQ2Mi1WmHqe_CBlFMwbY_lgt4SeoDhDFf1GD-qyVAD6lZs6oA2j6mNx9V6woW5Gw%3D%3D
Research output: Contribution to journal › Article › Scientific › peer-review

Commercialising reclaimed materials in earthworks – guidelines for productization and the process of appending these materials in the Finnish national code of practice
To decrease the use of non-renewable natural resources as well as environmental effects of earth-works, natural aggregate materials can be replaced with recycled materials acquired from surplus soil, industrial by-products and waste, etc. When wishing to increase the usage of these reclaimed materials (=“UUMA”-material), the usage must be straightforward for developers, designers and constructors alike. To make this possible, the materials must have design guidelines for their appro-priate applications. They must be productized and CE marked or otherwise authorized, and the con-struction guidelines for the materials must be included in the Finnish general specifications for in-frastructural construction works (InfraRYL). As productization is especially important in increasing the usage of UUMA materials, guidelines for vendors are being drawn that present information on commercializing reclaimed materials to be used in earthworks. The guidelines for productization are being prepared in the Finnish national UUMA2 programme (2013-2017, www.uuma2.fi), which was created to promote the use of recycled materials in earthworks.

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering, Research area: Infrastructure Construction, Research group: Earth Constructions, Research group: Track Structures, Ramboll Finland Ltd.
Contributors: Koivisto, K., Forsman, J., Ronkainen, M., Lahtinen, P., Kolisoja, P., Kuula, P.
Number of pages: 10
Publication date: 2016

Host publication information
Title of host publication: Proceedings of the 17th Nordic Geotechnical Meeting Reykjavik Iceland : Challenges in Nordic Geotechnic 25th - 28th of May
Place of publication: Reykjavik
Publisher: Icelandic Geotechnical Society
ISBN (Electronic): 978-9935-24-002-6
Electronic versions:
Commercialising reclaimed materials in earthworks 2016

URLs:
http://urn.fi/URN:NBN:fi:tuni-202005205536
URLs:
http://www.ngm2016.com/
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Comparative analysis and discussion

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P. S., Katko, T. S.
Pages: 219-240
Publication date: 2005

Host publication information
Title of host publication: Water, Time and European Cities. History matters for the Futures
Place of publication: Tampere
Publisher: Tampere University Press
Editors: Juuti, P. S., Katko, T. S.
ISBN (Print): 951-44-6337-4
URLs:
http://urn.fi/urn:isbn:951-44-6337-4

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 18528
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Comparing the energy required for fine grinding torrefied and fast heat treated pine

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering, Urban circular bioeconomy (UrCirBio)
Contributors: Kokko, L., Tolvanen, H., Hämäläinen, K., Raiko, R.
Pages: 219-223
Publication date: 2012
Peer-reviewed: Yes

Publication information
Journal: Biomass & Bioenergy
Volume: 42
Issue number: Jul
ISSN (Print): 0961-9534
Ratings:
Scopus rating (2012): CiteScore 5.1 SJR 1.516 SNIP 1.725
Original language: English
DOIs:
10.1016/j.biombioe.2012.03.008

Bibliographical note
Contribution: organisation=epr,FACT1=1
Publisher name: Elsevier Ltd.
Source: researchoutputwizard
Source ID: 4515
Research output: Contribution to journal › Article › Scientific › peer-review

Comparison between the Oocupational ELF magnetic field exposure in Finland and in Italy

General information
Publication status: Published

MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L., Lahtinen, S., Gobba, F.
Pages: 2 p
Publication date: 2011

Host publication information
Title of host publication: 10th International Conference European Bioelectromagnetics Association, 21-24 February 2011, Rome, Italy
Place of publication: Rome
Publisher: European Bioelectromagnetics Association

Publication series
Name: International Conference European Bioelectromagnetics Association
Publisher: European Bioelectromagnetics Association

Bibliographical note
ei ut-numeroa 22.3.2014
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 6419
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Comparison of air pressure difference, air change rates, and CO2 concentrations in apartment buildings before and after energy retrofits

Impacts of energy retrofits on air pressure differences across building envelope, air change rate (ACR), and indoor carbon dioxide (CO2) concentrations were studied. Measurements were performed before and after the retrofits of multi-family buildings during heating season in two Northern European countries: Finland and Lithuania. In the Finnish case buildings (Napartments = 128), pressure differences against outdoor were within national guideline values before the retrofits in 52% and after the retrofits in 42% of the buildings with mechanical exhaust ventilation system. The values were within the guidelines before the retrofits in 33% and after the retrofits in 20% in buildings with natural ventilation, correspondingly. In the Lithuanian case buildings (N-apartments = 31), pressure differences against outdoor were within the same guideline values before the retrofits in 77% and after the retrofits in 52% of the buildings. After the retrofits, higher air pressure differences and ACR, as well as lower CO2 concentrations, were observed in Finnish buildings with mechanical ventilation. On the contrary, lower air pressure differences and ACR, as well as higher CO2 concentrations, were observed in Lithuanian buildings with natural ventilation. (C) 2017 Elsevier Ltd. All rights reserved.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Civil Engineering, Research group: Concrete and Bridge Structures, Research area: Structural Engineering , Kaunas Univ Technol, Kaunas University of Technology, Dept Environm Technol, Natl Inst Hlth & Welf, Finland National Institute for Health & Welfare, Dept Hlth Protect
Contributors: Leivo, V., Prasauskas, T., Turunen, M., Kiviste, M., Aaltonen, A., Martuzevicius, D., Haverinen-Shaughnessy, U.
Number of pages: 8
Pages: 85-92
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: Building and Environment
Volume: 120
ISSN (Print): 0360-1323
Ratings:

Scopus rating (2017): CiteScore 7.7 SJR 2.169 SNIP 2.583
Original language: English
Electronic versions:

BAE_D_17_00358_revision. Embargo ended: 9/05/19
DOIs:

10.1016/j.buildenv.2017.05.002
URLs:

http://urn.fi/URN:NBN:fi:tuni-201911196079. Embargo ended: 9/05/19
Research output: Contribution to journal › Article › Scientific › peer-review

Comparison of community managed projects and conventional approaches in rural water supply of Ethiopia

This study aimed to compare Community Managed Projects (CMP) approach with the conventional approaches (Non-CMP) in the case of Ethiopia. The data collection methods include a household survey (n=1806), community representative interviews (n=49), focus group discussions with district water experts (n=48) and observations of water systems (n=49). The data were collected from seven districts of two regions of Ethiopia. The study shows that CMP have a better platform to involve the community than non-CMP. In terms of reducing distances to water points, all approaches succeeded. However, the intended amount of water supplied is not achieved in all the cases: only 25% of CMP users and 18% of non-CMP users are able to get water according to the national standard, 15 L per capita per day. Fee collection in the approaches has a high disparity in favour of CMP. To keep long-lasting services, three requirements need to be particularly fulfilled: quantity, quality and accessibility.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Community-Led Accelerated WASH (COWASH) Project
Contributors: Behailu, B. M., Suominen, A., Katko, T. S., Mattila, H., Yayehyirad, G.
Number of pages: 15
Pages: 292-306
Publication date: 30 Sep 2016
Peer-reviewed: Yes

Publication information

Journal: African Journal of Environmental Science and Technology
Volume: 10
Issue number: 9
Article number: 04AF23059936
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DOIs:
10.5897/AJEST2016.2132
URLs:
http://urn.fi/URN:NBN:fi:tty-201608164415
URLs:
http://www.academicjournals.org/journal/AJEST/article-full-text-pdf/04AF23059936
Research output: Contribution to journal › Article › Scientific › peer-review

Comparison of the total mercury content in sediment samples with a mercury sensor bacteria test and Vibrio fischeri toxicity test

The suitability of a luminescent bacterial sensor strain Escherichia coli MC1061(pTOO11) [Virta, M.; Lampinen, J.; Karp, M. Anal Chem 1995, 67, 667-669] for the measuring of mercury from sediment samples was evaluated. The sensor strain is based on the control of expression of a reporter gene, firefly luciferase, by a mercury sensitive regulation unit. The sensor responds to mercury by increased luminescence as a consequence of increased production of the reporter protein luciferase. The method is simple to perform since the luminescence is recorded with a portable luminometer and the sensor bacteria are freeze-dried. The results obtained from river sediment samples were compared with the total mercury content of the samples, which was measured by atomic absorption spectrometry and Leco(R) Mercury analyzer and the modified photobacteria luminescence inhibition test (Lappalainen, J.; Juvonen, R.; Vaajasaari, K.; Karp, M. Chemosphere 1999, 38, 1069-1083). The correlation between the bacterial sensor results with the total mercury content, ranging from 0.01 mg/kg to 16 mg/kg, was significant with 32 samples tested (R-2 UP to 0.8115). There was no correlation between the total mercury content and toxicity measured with Vibrio fischeri in this sample panel, (C) 2000 by John Wiley & Sons, Inc.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: University of Turku
Contributors: Lappalainen, J. O., Karp, M. T., Juvonen, R., Virta, M. P. J., Nurmi, J.
Number of pages: 6
Pages: 443-448
Publication date: Dec 2000
Peer-reviewed: Yes

Publication information

Journal: Environmental Toxicology
Volume: 15

Issue number: 5
ISSN (Print): 1520-4081
Ratings:

Scopus rating (2000): SJR 0.623 SNIP 1.106
Original language: English
Keywords: heavy metal, biosensor, mercury, sediment, REPORTER, ARSENITE, ENVIRONMENT, ANTIMONITE, BIOSENSOR, STRAIN
DOIs:

10.1002/1522-7278(2000)15:5<443::AID-TOX12>3.0.CO;2-L
Source: WOS
Source ID: 000165446600012
Research output: Contribution to journal › Article › Scientific › peer-review

Comparison the portable service platforms influence to electric field exposure at 110 kV substations

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Pääkkönen, R., Kuisti, H., Gonzalez, J. A., Tarao, H., Gobba, F., Korpinen, L.
Pages: 215-217
Publication date: 2012

Host publication information
Title of host publication: The Bioelectromagnetics Society 34th Annual Meeting, June 17, 2012 - June 22, 2012, Brisbane, Australia
Publisher: The Bioelectromagnetics Society
ISBN (Print): 978-0-646-57844-6

Publication series
Name: The Bioelectromagnetics Society Annual Meeting
URLs:

http://www.bems.org

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ei ut-numeroa 27.8.2013
Contribution: organisation=epr,FACT1=1
Publisher name: The Bioelectromagnetics Society
Source: researchoutputwizard
Source ID: 4996
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Conclusions

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P. S., Katko, T. S., Vuorinen, H. S.
Pages: 259-262
Publication date: 2007

Host publication information
Title of host publication: 2007. Environmental History of Water - Global views on community water supply and sanitation. IWA Publishing
Editors: Juuti P.S., K. T., Vuorinen, H.

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14494
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Conclusions

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P. S., Katko, T. S., Vuorinen, H. S.
Pages: 501-506
Publication date: 2007

Host publication information
Title of host publication: 2007. Environmental History of Water - Global views on community water supply and sanitation. IWA Publishing
Editors: Juuti P.S., K. T., Vuorinen, H.

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14495
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Conclusions

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P. S., Katko, T. S., Vuorinen, H. S.
Pages: 93-96
Publication date: 2007

Host publication information
Title of host publication: 2007. Environmental History of Water - Global views on community water supply and sanitation. IWA Publishing
Editors: Juuti P.S., K. T., Vuorinen, H.

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14493
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Conclusions: Does History Matter? Present Water Governance Challenges and Future Implications

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P. S., Katko, T. S., Vuorinen, H. S.
Pages: 589-592
Publication date: 2007

Host publication information
Title of host publication: 2007. Environmental History of Water - Global views on community water supply and sanitation. IWA Publishing
Editors: Juuti P.S., K. T., Vuorinen, H.

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14496
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Continuous removal and recovery of tellurium in an upflow anaerobic granular sludge bed reactor

Continuous removal of tellurite (TeO32−) from synthetic wastewater and subsequent recovery in the form of elemental tellurium was studied in an upflow anaerobic granular sludge bed (UASB) reactor operated at 30 °C. The UASB reactor was inoculated with anaerobic granular sludge and fed with lactate as carbon source and electron donor at an organic loading rate of 0.6 g COD L−1 d−1. After establishing efficient and stable COD removal, the reactor was fed with 10 mg TeO32−. L−1 for 42 d before increasing the influent concentration to 20 mg TeO32−. L−1. Tellurite removal (98 and 92%, respectively, from 10 and 20 mg Te. L−1) was primarily mediated through bioreduction and most of the removed Te was retained in the bioreactor. Characterization using XRD, Raman spectroscopy, SEM-EDX and TEM confirmed association of tellurium with the granular sludge, typically in the form of elemental Te(0) deposits. Furthermore, application of an extracellular polymeric substances (EPS) extraction method to the tellurite reducing sludge recovered up to 78% of the tellurium retained in the granular sludge. This study demonstrates for the first time the application of a UASB reactor for continuous tellurite removal from tellurite-containing wastewater coupled to elemental Te(0) recovery.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Contributors: Mal, J., Nancharaiah, Y. V., Maheshwari, N., van Hullebusch, E. D., Lens, P. N.
Number of pages: 9
Pages: 79-88
Publication date: Apr 2017
Peer-reviewed: Yes
Early online date: 26 Dec 2016

Publication information

Journal: Journal of Hazardous Materials
Volume: 327
ISSN (Print): 0304-3894
Ratings:

Scopus rating (2017): CiteScore 10.8 SJR 1.787 SNIP 1.988
Original language: English
Keywords: Tellurite, Bioreduction, Te(0), recovery, anaerobic granular sludge, UASB reactor
DOIs:

10.1016/j.jhazmat.2016.12.052
Source: RIS
Source ID: urn:72FA4ADA003E818A81B125B5D178D7F6
Research output: Contribution to journal › Article › Scientific › peer-review

Conversion of Solid Waste into Functional Carbon Materials: A Review

Population explosion and increasing living standard of people resulted in generation of more than a Giga ton of waste per annum worldwide. Hence waste is one of the global problems in 21st century and expected that waste generation continues in future also. Every human activity is left with some waste. There are some major sectors for waste generation, such as manufacturing sector, agricultural sector (in the form of biomass) and municipality waste etc. These wastes are having minimal value or even negative values and creating problem or burden to the environment, human health etc. Therefore, it is utmost important to process and manage those wastes properly. The existing waste management processes involves: recycling, dumping and landfilling, incineration/combustion etc., which are neither sufficient to nullify the adverse effect of the waste nor economic process. These management processes involve human intervention and thereby resulting huge expenses. Nowadays, there is a paradigm shift from management of waste into conversion of waste producing fertilizer, fuel, energy as well as carbon materials etc. In this review, effort is given exclusively to summarize the different processes of waste conversion into functional carbon material such as activated carbon, porous carbon, carbon nanotube, graphene, carbon dot, carbon fibre etc. It has been discussed with the help of illustrative examples from the literatures.

General information

Publication status: Published
MoE publication type: A2 Review article in a scientific journal
Organisations: Materials Science, Research group: Plastics and Elastomer Technology
Contributors: Gogoi, M., Layek, R., Vuorinen, J., Mahato, M.
Pages: 52-68
Publication date: 1 Mar 2017
Peer-reviewed: Yes

Publication information

Journal: Energy and Environment Focus

Volume: 6
Issue number: 1
ISSN (Print): 2326-3040
Original language: English
DOIs:
10.1166/eef.2017.1237
Research output: Contribution to journal › Review Article › Scientific › peer-review

Co-operation between technical education of university and electro-technical standardization association

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Hieta-Wilkman, S., Vesa, J., Korpinen, L.
Pages: 165-168
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Elektronika ir Elektrotechnika
Volume: 10
Issue number: 106
ISSN (Print): 1392-1215
Ratings:
Scopus rating (2010): SJR 0.216 SNIP 0.329
Original language: English

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 8075
Research output: Contribution to journal › Article › Scientific › peer-review

Co-production of 1,3 propanediol and long-chain alkyl esters from crude glycerol
Crude glycerol is an excellent carbon source for bacterial production systems. Bacterial fermentation often generates by-products that can offer an additional carbon pool to improve the product profile for optimal valorization. In this study, the properties of two phylogenetically distinct bacteria, Acinetobacter baylyi ADP1 and Clostridium butyricum, were coupled in a one-pot batch process to co-produce 1,3 propanediol (PDO) and long-chain alkyl esters (wax esters, WEs) from crude glycerol. In the process, A. baylyi deoxidized the growth medium allowing glycerol fermentation and PDO production by C. butyricum. Reaeration of the co-cultivations enabled A. baylyi to metabolize the fermentation by-products, acetate and butyrate, and synthesize intracellular WEs. To improve PDO production and A. baylyi growth, carbon and macronutrients in the growth medium were screened and optimized using Plackett-Burman and Box-Behnken models. The validation experiment revealed a good correlation between the observed and predicted values. The salting-out method recovered 89.5% PDO from the fermentation broth and in vacuo extraction resulted in a PDO content of 5.3 g L-1. Nuclear magnetic resonance revealed a WE content and yield of 34.4 ± 1.4 mg L-1 and 34.2 ± 3.2 mg WE g-1 dry cell weight, respectively. A molar yield of 0.65 mol PDO mol-1 and 0.62 µmol WE mol-1 crude glycerol was achieved with the synthetic consortium. This work emphasizes the strength of response surface methodology in improving production processes from the mutualistic association of divergent bacterial species in consortium. The co-production of PDO and WEs from crude glycerol is demonstrated for the first time in this study.

General information
Publication status: E-pub ahead of print
MoE publication type: A1 Journal article-refereed
Organisations: Materials Science and Environmental Engineering, Research group: Bio- and Circular Economy
Contributors: Mangayil, R., Efimova, E., Konttinen, J., Santala, V.
Number of pages: 9
Pages: 81-89
Publication date: 11 Jul 2019
Peer-reviewed: Yes

Publication information
Journal: New Biotechnology
Volume: 53
ISSN (Print): 1871-6784

Ratings:

Scopus rating (2019): CiteScore 7.8 SJR 0.949 SNIP 1.224
Original language: English
DOIs:

10.1016/j.nbt.2019.07.003

Bibliographical note

Source: PubMed
Source ID: 31302257
Research output: Contribution to journal › Article › Scientific › peer-review

Cracking of the End Diaphragm of a Post-tensioned Beam Bridge
In concrete beam bridges, the end diaphragm at the end of the bridge is a common structural component that connects the main beams and transfers the beam loads to the bridge bearings. In integral bridges the end diaphragm also retains the soil of embankments due to the absence of abutments. Cracking of the front surface on the end diaphragm has been detected in post-tensioned beam bridges in Finland and Sweden. Presumably the post-tensioning of the bridge and the shaping and detailing of the connection of the end diaphragm and main beam have an effect on cracking tendency. The aim of this study is to examine the structural behaviour and the cracking potential of end diaphragms using linear analysis of the post-tensioned bridge and to find measures to prevent the cracking.

The observations collected through field surveys are compared to results of linear FE analysis to clarify the cause of the cracking. The verification of model is performed by comparison of patterns of cracking observed in field surveys and the distribution of maximum tensile stresses in the FE model. With model variations, the effectiveness of measures for the prevention of cracking are
observed.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Civil Engineering, Research group: Concrete and Bridge Structures, Research group: Vaativat rakenteet, A-Insinöörit Civil Oy
Contributors: Kuusela, M., Asp, O., Laaksonen, A.
Number of pages: 15
Pages: 89-104
Publication date: 28 Aug 2019
Peer-reviewed: Yes

Publication information
Journal: Nordic Concrete Research
Volume: 60
Issue number: 1
Article number: 6
ISSN (Print): 0800-6377
Original language: English
Keywords: Bridge,, post-tensioning,, cracking., concrete,, end diaphragm,
Electronic versions:

Cracking of the End Diaphragm of a Post-tensioned Beam Bridge
DOIs:

10.2478/ncr-2019-0001
URLs:

http://urn.fi/URN:NBN:fi:tuni-201911286406

Bibliographical note
EXT="Kuusela, Mikko"
Research output: Contribution to journal › Article › Scientific › peer-review

Dags att syna utmaningarna inom vattenförsörjningen

General information
Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Department of Chemistry and Bioengineering
Contributors: Katko, T. S.

Number of pages: 2
Pages: 30-31
Publication date: 2013
Peer-reviewed: Unknown

Publication information
Journal: Finlands Kommuntidning
Volume: 19
Issue number: 8
ISSN (Print): 1235-9343
Original language: Swedish

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-02-15
Publisher name: Finlands Kommunförbund
Source: researchoutputwizard
Source ID: 2518
Research output: Contribution to journal › Article › Professional

Denitrifying microbial communities along a boreal stream with varying land-use
Streams have an important role in regulating nitrogen (N) transportation from terrestrial ecosystems to downstream waters. Here, we examined how catchment land-use affects potential denitrification rates and the function and composition of denitrifier communities in boreal stream sediments, using stable isotope incubations and qPCR and 454-pyrosequencing targeted on *nirS*, *nirK*and *nosZ* genes. Although land-use influenced the water chemistry as higher nitrite + nitrate (NO_x^-) concentration at the agriculture-affected sampling point, sediment organic matter content was found to be the key factor in regulating potential denitrification rates. However, the abundance as well as the diversity and community composition of denitrifying microbes, and genetic N_2O production potential (the ratio between *nirS*+ *nirK*and *nosZ* gene abundances) were connected to both NO_x^- and sediment quality. Overall, our results suggest that catchment land-use-driven changes in N and carbon availability affect the denitrification rates, and possibly N_2:N_2O production ratio, in boreal streams, through altering denitrifier abundance and community composition.

General information
Publication status: E-pub ahead of print
MoE publication type: A1 Journal article-refereed
Organisations: Materials Science and Environmental Engineering, University of Jyväskylä, University of Eastern Finland, University of Helsinki, University of Jyväskylä
Contributors: Aalto, S. L., Saarenheimo, J., Arvola, L., Tiirola, M., Huotari, J., Rissanen, A. J.
Publication date: 24 Jul 2019
Peer-reviewed: Yes

Publication information
Journal: Aquatic Sciences
Volume: 81
Issue number: 59
ISSN (Print): 1015-1621
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Scopus rating (2019): CiteScore 4.7 SJR 0.981 SNIP 1.058
Original language: English
Electronic versions:
Aalto2019_Article_DenitrifyingMicrobialCommuniti
DOIs:
10.1007/s00027-019-0654-z
URLs:
http://urn.fi/URN:NBN:fi:tty-201909052066
Research output: Contribution to journal › Article › Scientific › peer-review

Design aspects of all atomic layer deposited TiO2–Fe2O3 scaffold-absorber photoanodes for water splitting
Iron and titanium oxides have attracted substantial attention in photoelectrochemical water splitting applications. However, both materials suffer from intrinsic limitations that constrain the final device performance. In order to overcome the limitations of the two materials alone, their combination has been proposed as a solution to the problems. Here we report on the fabrication of an atomic layer deposited (ALD) Fe2O3 coating on porous ALD-TiO2. Our results show that successful implementation requires complete mixing of the TiO2 and Fe2O3 layers via annealing resulting in the formation of a photoactive iron titanium oxide on the surface. Moreover, we found that incomplete mixing leads to crystallization of Fe2O3 to hematite that is detrimental to the photoelectrochemical performance. IPCE and transient photocurrent measurements performed using UV and visible light excitation confirmed that the iron titanium oxide extends the

photocurrent generation to the visible range. These measurements were complemented by transient absorption spectroscopy (TAS), which revealed a new band absent in pristine hematite or anatase TiO2 that we assign to charge transfer within the structure. Taken together, these results provide design guidelines to be considered when aiming to combine TiO2 and Fe2O3 for photoelectrochemical applications.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Chemistry and Bioengineering, Research group: Chemistry & Advanced Materials, Research group: Surface Science, Photonics, Materials Science, Research group: Plastics and Elastomer Technology
Contributors: Hiltunen, A., Ruoko, T., Iivonen, T., Lahtonen, K., Ali-Löytty, H., Sarlin, E., Valden, M., Leskelä, M., Tkachenko, N.
Pages: 2124-2130
Publication date: 31 Jul 2018
Peer-reviewed: Yes

Publication information

Journal: Sustainable Energy & Fuels
Volume: 2
Issue number: 9
ISSN (Print): 2398-4902
Ratings:

Scopus rating (2018): CiteScore 3.1 SNIP 0.85
Original language: English
ASJC Scopus subject areas: Electrochemistry, Renewable Energy, Sustainability and the Environment, Surfaces, Coatings and Films
Keywords: Water splitting, Atomic layer deposition (ALD), Titanium dioxide, Hematite, Cellulose, Template
DOIs:

10.1039/C8SE00252E
Research output: Contribution to journal › Article › Scientific › peer-review

Detecting bioavailable toxic metals and metalloids from natural water samples using luminescent sensor bacteria

We have generated microbial sensors for analyzing the presence of various metals or metalloids by recombinant DNA technology. The strains are based on strictly regulated promoters controlling the expression of the firefly luciferase gene in microbial cells. The regulator-reporter constructs are located in shuttle plasmids capable of replicating in gram-negative or -positive microbial organisms. The sensors developed are real-time indicators of metal responsive gene expression giving results in approximately 30 min, with optimal induction times ranging from 60 to 240 min. We describe here the performance of these metal sensing bacteria for the assessment of different water samples spiked with lead, arsenic, mercury or cadmium. We show that these bacteria are sensitive detectors of metal bioavailability, which is difficult or even impossible to measure by traditional analytical chemistry methods. All measurements were done using freeze-dried bacteria, which makes these sensors reagent-like and also easy to use in field conditions.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Univ Turku, University of Turku, Dept Biotechnol
Contributors: Tauriainen, S. M., Virta, M. P. J., Karp, M. T.
Number of pages: 6
Pages: 2661-2666
Publication date: Jul 2000
Peer-reviewed: Yes

Publication information

Journal: Water Research
Volume: 34
Issue number: 10
ISSN (Print): 0043-1354
Ratings:

Scopus rating (2000): SJR 1.308 SNIP 1.639
Original language: English
Keywords: luciferase, luc-gene, environment, cadmium, mercury, arsenite, ESCHERICHIA-COLI, ARSENITE, LUCIFERASE, ANTIMONITE, MERCURY, LEAD, EXPRESSION, BIOSENSOR, CADMIUM, GENES
DOIs:

10.1016/S0043-1354(00)00005-1

Source: WOS
Source ID: 000087436600004
Research output: Contribution to journal › Article › Scientific › peer-review

Deterioration mechanisms and life cycle of concrete monoblock railway sleepers in Finnish conditions

Thirty eight sleepers aged 30 to 40 years old were removed from Finnish railway lines and were loaded. Twelve new sleepers were also tested. The old sleepers fulfilled most of the requirements specified for the new ones. The old sleepers were also much more resistant to loading than predicted by structural calculations. The purpose of field tests was to establish the role of traffic loads in the life-cycle of sleepers: the actual stresses and moments in sleepers due to traffic loads; the distribution of the load through the underside of the sleeper to the ballast; and the variation in ballast-sleeper reaction on different sections of track in different seasons. Strain changes at the top surfaces of sleepers were measured on tracks while the rail was loaded by passing trains. Ballast-sleeper reactions tended to be concentrated under the rail along a length of sleeper of approximately 350 mm towards the centre of the track. The mean bending moments determined at the rail seat and centre of sleepers were about ±2.5 kNm, and the maximum moments were up to ±10 kNm. The purpose of fatigue loading tests was to analyse the long term properties of the sleepers and the effect of fatigue on the stiffness of sleepers. Several load levels were chosen in order to estimate the significance of the fatigue in a real operating situation. The fatigue limit determined based on the loading tests and the computational limit state of crack formation were clearly higher than the bending moments measured in the field tests.

General information

Publication status: Published
MoE publication type: D3 Professional conference proceedings
Organisations: Department of Civil Engineering, Research group: Vaativat rakenteet, Research group: Concrete and Bridge Structures, Research group: Track Structures
Contributors: Kerokoski, O., Rantala, T., Nurmikolu, A.
Publication date: 31 May 2016

Host publication information

Title of host publication: WCRR 2016 Proceedings : 11th World congress on railway research, 29.5-2.6.2016, Milano
URLs:

http://www.wcrr2016.org/

Bibliographical note

ei isbn 8.12.16
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Professional

Developing and testing characterization methods for droplet combustion - Part I

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Pääkkönen, A., Peltola, A., Pitkänen, A., Mäkiranta, R., Saario, A., Oksanen, A.
Number of pages: 6
Pages: 1-6
Publication date: 2010
Peer-reviewed: Yes

Publication information

Journal: Archivum Combustionis
Volume: 30
Issue number: 4
ISSN (Print): 0208-4198
Original language: English

Bibliographical note

Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 8921
Research output: Contribution to journal › Article › Scientific › peer-review

Developing and testing characterization methods for droplet compustion - part II

General information

Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Pääkkönen, A., Pitkänen, A., Mäkiranta, R., Saario, A., Oksanen, A.
Number of pages: 10
Pages: 1-10
Publication date: 2011

Host publication information
Title of host publication: 9th European Conference on Industrial Furnaces and Boilers, Estoril, Portugal, 26-29 April, 2011
Place of publication: Estoril
Publisher: INFUB

Publication series
Name: European Conference on Industrial Furnaces and Boilers
Publisher: INFUB

Bibliographical note
ei ut-numeroa 26.4.2014
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 6938
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Developing community water services and cooperation in Finland and the South

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering
Contributors: Katko, T. S., Rautavaara, A.
Number of pages: 5
Pages: 240-244
Publication date: 2013

Host publication information
Title of host publication: Free Flow - Researching Water Security Through Cooperation
Publisher: United Nations Educational, Scientific and Cultural Organization; Unesco Publishing; Tudor Rose
Editors: Griffiths, J., Lambert, R.
ISBN (Print): 978-92-3-104256-0

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-11-29
Source: researchoutputwizard
Source ID: 2525
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Development of an assessment protocol: the impact of energy retrofits on indoor environmental quality and public health in the existing building stock

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Research group: Concrete and Bridge Structures, Research area: Structural Engineering, Department of Civil Engineering, Research group: Building Physics, Kaunas Univ Technol, Kaunas University of Technology, Dept Environm Technol, Natl Inst Hlth & Welf, Finland National Institute for Health & Welfare, Dept Environm Hlth
Contributors: Du, L., Leivo, V., Kiviste, M., Martuzevicius, D., Turunen, M., Prasauskas, T., Haverinen-Shaughnessy, U.
Publication date: May 2015

Host publication information
Title of host publication: Healthy Buildings 2015 Europe (HB 2015)
Publisher: International Society for Indoor Air Quality and Climate
ISBN (Print): 978-0-9846855-4-7
URLs:
http://hb2015-europe.org/

Development of superhydrophobic coating on paperboard surface using the Liquid Flame Spray

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering, Department of Physics
Contributors: Teisala, H., Tuominen, M., Aromaa, M., Mäkelä, J. M., Stepien, M., Saarinen, J., Toivakka, M., Kuusipalo, J.
Pages: 436-445
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Surface and Coatings Technology
Volume: 205
Issue number: 2
ISSN (Print): 0257-8972
Ratings:
Scopus rating (2010): SJR 1.145 SNIP 1.661
Original language: English
DOIs:
10.1016/j.surfcoat.2010.07.003
URLs:
http://www.elsevier.com/locate/surfcoat

Bibliographical note
Contribution: organisation=epr pap,FACT1=0.5
Contribution: organisation=fys,FACT2=0.5
Source: researchoutputwizard
Source ID: 9386
Research output: Contribution to journal › Article › Scientific › peer-review

Digestate valorization for bioremediation of petroleum hydrocarbons contaminated soils

Petroleum contaminated soils constitute an environmental issue which may be solved with the help of bioremediation. Soil bioaugmentation with petroleum degrading microorganisms is an efficient clean-up strategy. Currently scientific interest is focused on searching new sources of microorganisms able to degrade hydrocarbons which serve as species pools for enrichments during inoculum preparation. Bioaugmentation strategy are especially important in soils with low level of organic matter and low microbial counts (e.g. after intensive chemical treatments). No studies were performed up to date while considering the potential of organic fertilizers and amendments as a microbial seeding source for bioremediation. In this thesis, for the first time, digestate as an example of organic amendment, was studied in terms of indigenous microbial community which can be involved in degradation of linear hydrocarbons. Digestate is an organic by-product of biogas production via anaerobic digestion processes and has a great potential as soil fertilizer due to concentrated nutrients and low content of easily biodegradable compounds (which could be used by bacteria as a preferential carbon source over hydrocarbons). However, the potential of microbial community of digestate was never studied in terms of petroleum hydrocarbons (PHCs) degradation.

In this thesis, digestate was examined as microbial seeding for bioremediation of weathered petroleum hydrocarbon contaminated soils. The goals were : I) to check the presence of alkanes degrading bacteria in digestate enrichments and compare alkanes degradation potential with enrichments from petroleum contaminated soils, ii) verify the effect of digestate application on soil microbial community and microbial activity, iii) study the presence of functional genes responsible for alkanes degradation (alkB genes) in digestate and amended soils.

During the first experiment, 7 microbial enrichments were developed from various digestates (including composted digestate), a petroleum contaminated soil and from mix of soil with digestate. After 3 weeks of incubation the highest diesel fuel removal was observed for enrichments originating from composted digestate and from the petroleum contaminated soil (78 and 77 % diesel fuel removal, respectively). Enrichments obtained from digestate mixed with soil displayed lower performance than single source enrichments. In all enrichments, presence of alkB genes was promoted during the incubation. The experiment revealed the presence of alkB genes in bacteria from digestate and confirmed their ability to degrade diesel fuel.

In a second experiment, 6 different treatments were performed in microcosm using two industrial petroleum contaminated soils having different textures: a clay rich soil and a sandy soil. After 30 days of incubation, the highest petroleum hydrocarbons removal was observed in microcosms containing: digestate together with bulking agent (17.8 % and 12.7 % higher than control in clay rich soil and sandy soil, respectively) or; digestate together with immobilized bacteria (13.4 %

and 9 % higher than control in clay rich soil and sandy soil, respectively). Distinct microbial groups were formed in amended and non-amended soils. Genera containing species able to degrade hydrocarbons like Acinetobacter and Mycobacterium were abundant in digestate and soil amended with digestate. The study proved that digestate contains high concentration of alkB genes, significantly higher than contaminated soils. Application of digestate significantly increased the level of alkB genes in soils which remained high during the treatment.

In a third experiment, a contaminated soil was incubated with digestate and bulking agent (used to increase porosity of soil mixture and facilitate air transfer) in bioreactors with active aeration. Initial alkB concentration was 1.5 % in contaminated soil and 4.5 % in digestate. During incubation of soil with digestate, alkB percentage increased up to 11.5 % and after additional
inoculation with immobilized bacteria this value increased up to 60 % (alkB percentage for treatment with mineral nutrients reached 0.4 %). Addition of digestate positively affected soil respiration and bacterial density, which was concomitant with enhanced hydrocarbons degradation. Incubation of soil with digestate for 2 months resulted in 74 % of hydrocarbons removal, while extra addition of immobilized bacteria increased this value to 95 %. Digestate
increased soil bacterial density and diversity of hydrocarbons degrading taxa. The experiment clearly revealed the advantage of digestate over mineral fertilizer due to soil enrichment in TPH degrading taxa and thus a more efficient bioremediation.

This thesis for the first time analysed the potential of indigenous bacteria from organic nutrient source in bioremediation. The obtained results proved that digestate is a good source of bacteria caring alkB genes curtail in alkanes metabolism. Moreover, observed population of bacterial caring alkB genes was significantly greater in digestate comparing to contaminated soils. Application of digestate allowed to increase microbial activity and maintain high content of alkB genes in the soil which enhanced PHCs degradation.

Experiments performed during the thesis are contributing for better understanding of bioremediation process with the use of organic amendment as a nutrient source. Presented advantages of digestate over mineral fertilizers were evaluated and confirmed. This thesis for the first time proposes organic amendment, like digestate to be considered not only as a nutrient source but also as a valuable source of microorganisms for soil bioaugmentation/biostimulation. Developed experimental treatments are a good starting point for further assessment of digestate during field scale treatments, however detailed risk assessment analysis including effect of potential pathogens contained in digestate on human health and studies analysing the effect of digestate leachates on groundwater quality need to be performed.

General information
Publication status: Published
MoE publication type: G5 Doctoral dissertation (article)
Organisations: Materials Science and Environmental Engineering
Contributors: Gielnik, A.
Number of pages: 95
Publication date: 11 Dec 2019

Publication information
Publisher: Tampere University
Original language: English

Publication series
Name: Tampere University Dissertations
URLs:

http://urn.fi/URN:NBN:fi:tuni-202001151264. Embargo ended: 11/12/20
Research output: Book/Report › Doctoral thesis › Collection of Articles

Diversity of microcystin-producing cyanobacteria in spatially isolated regions of Lake Erie
The diversity of microcystin-producing cyanobacteria in the western basin of Lake Erie was studied using sequence analysis of mcyA gene fragments. Distinct populations of potentially toxic Microcystis and Planktothrix were found in spatially isolated locations. This study highlights previously undocumented diversity of potentially toxic cyanobacteria.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: The University of Tennessee, Knoxville
Contributors: Rinta-Kanto, J. M., Wilhelm, S. W.
Number of pages: 3
Pages: 5083-5085
Publication date: Jul 2006
Peer-reviewed: Yes

Publication information

Journal: Applied and Environmental Microbiology
Volume: 72
Issue number: 7
ISSN (Print): 0099-2240
Ratings:

Scopus rating (2006): SJR 2.076 SNIP 1.6
Original language: English
DOIs:

10.1128/AEM.00312-06
URLs:

http://www.mendeley.com/research/diversity-microcystinproducing-cyanobacteria-spatially-isolated-regions-lake-erie
Source: Mendeley
Source ID: 5780da10-f76e-31e8-b554-bfc0ff481d10
Research output: Contribution to journal › Article › Scientific › peer-review

Diversity of the water supply and sanitation sector: roles of municipalities in Europe

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering
Contributors: Pietilä, P.
Number of pages: 13
Pages: 99-111
Publication date: 2013

Host publication information
Title of host publication: Water Services Management and Governance : Lessons for a Sustainable Future
Publisher: IWA Publishing
Editors: Katko, T. S., Juuti, P. S., Schwartz, K., Rajala, R. P.
ISBN (Print): 978-1-78040-022-8
ISBN (Electronic): 978-1-78040-073-0

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-09-29
Source: researchoutputwizard
Source ID: 3150
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Dry Toilet Sanitation as an Alternative Solution to the Rural Ethiopia
This paper intended to explore the sanitation situation of the rural Ethiopia and evaluate how the existing situation can welcome dry toilet as an alternative for sanitation. The study was based on the field survey, literature reviews and field observation during November-December of 2012 and 2013, and June 2014. The survey found out that a lot has been done in the area, but it is too early to declare that the question is solved. In terms of DT sanitation policy and promotion intra-ministerial collaborations are improving. Moreover, the traditional use of night soil for the crops that are eaten cooked is an interesting part to be taken into account when considering dry toilet.

General information
Publication status: Published
MoE publication type: D3 Professional conference proceedings
Organisations: Department of Civil Engineering
Contributors: Behailu, B. M.
Number of pages: 7
Publication date: Aug 2015

Host publication information
Title of host publication: Dry Toilet 2015 : 5th International Dry Toilet Conference
Electronic versions:

Dry_Toilet_Sanitation_as_an_Alternative
URLs:

http://www.huussi.net/wp-content/uploads/2015/06/Beshah-M.-Behailu_Full-paper_DT2015.pdf

http://urn.fi/URN:NBN:fi:tty-201708071661
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Professional

Dynamics of microbial communities in untreated and autoclaved food waste anaerobic digesters

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Urban circular bioeconomy (UrCirBio)
Contributors: Blasco, L., Kahala, M., Tampio, E., Ervasti, S., Paavola, T., Rintala, J., Joutsjoki, V.
Number of pages: 7
Pages: 3-9
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Anaerobe
Volume: 29
ISSN (Print): 1075-9964
Ratings:

Scopus rating (2014): CiteScore 4.1 SJR 1.015 SNIP 1.153
Original language: English
DOIs:

10.1016/j.anaerobe.2014.04.011

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-06-27
Publisher name: Academic Press; Anaerobe Society of the Americas, Inc.
Source: researchoutputwizard
Source ID: 178
Research output: Contribution to journal › Article › Scientific › peer-review

Ecological Sanitation - A Logical Choice? The Development of the Sanitation Institution in a World Society
Sustainability, encompassing ecological, economic as well as sociocultural aspects, has become a driving force for many political and administrational decisions. It is no longer enough to follow old practices or rely on profit margins – it is necessary to consider the needs of society and nature in a more holistic way as a larger whole. Sustainability is the key word also in terms of sanitation; ecological sanitation, or ecosan for short, has come to mark the sustainable approach to handling human excreta.

In 2014, there are still approximately 2.5 billion people in the world without access to adequate sanitation; 1.1 billion practice open defecation. Lack of sanitation is often – but not necessarily – linked to lack of clean drinking water and poor hygiene. However, poor wastewater treatment also occurs in more developed countries as well as in times of crisis. In the case of natural disasters, even waterborne sanitation, which is often considered the norm, does not prevent the risk of contamination from pathogens. Ecological sanitation aims at a closed cycle of nutrients and absence of water; dry toilets, composting and urine diversion help to return nutrients back into the soil.

Based on these challenges, it is necessary to examine alternatives to the current toilet institution that considers waterborne sanitation as the norm. This dissertation explores the feasibility of ecological sanitation as a potential alternative to the mainstream option and the aim is to discover which issues affect the development and change of the current waterborne toilet institution. From a multi- and interdisciplinary point of view, the dissertation determines the various aspects affected by ecosan, such as water and environment, health, culture, education, agriculture, business and technology, and from these points of view develops futures scenarios for sustainable sanitation practices. Technology is here defined beyond artefacts and processes encompassing also knowhow as well as the sociotechnical systems of use, including legislation, culture and practices.

The data collected for this research includes expert interviews (n=11), case studies from Ethiopia, Finland, New Zealand and Zambia, and literature review including various policy documents and legislation of the aforementioned case countries to shed light to the current state of ecological sanitation and how it is taken into account from a legal perspective. In addition, a two-round consensus-Delphi survey (n1=44, n2=22) together with theme seminars was conducted among Finnish experts to determine the future potential of ecological sanitation.

Through qualitative data analyses, the potential futures and desirable outcomes are mapped with the help of futures research and environmental scanning. The overall challenge of potentially changing the waterborne toilet institution is discussed in the light of the World Polity Theory – with the understanding that global norms are valid everywhere and that change eventually must start from intergovernmental actors rather than political decision makers.

This research brings more insight to the relatively unknown and overlooked subject of ecological sanitation. The integrated

approach offers new insight into sustainable sanitation practices and closed loop approach from view points of the various sectors of society, including social, economic and ecological aspects. The undisputed challenges of inadequate sanitation facilities faced by 2.5 billion people worldwide are generally not recognized in scientific literature, although several invaluable studies have contributed to the field. Still, concrete results for improvement are still required.

The results of this study find that ecological sanitation must be approached from a multidisciplinary point of view in order to understand the variety of sectors impacted by these sustainable practices. As a conclusion it can be stated that the traditional norms in waterborne sanitation are difficult to change but the pressure of limited phosphorus resources and deteriorating or non-existing infrastructure require alternative solutions to the norm. As yet, legislation has generally not allowed or considered the use of human excreta as fertiliser, but practices are slowly changing along with attitudes. Institutions do not change easily but can do so while attitudes, policies and practices all start adopting new ways of operating.

It is possible that in the future ecological sanitation will indeed be accepted as a feasible option along with other sanitation methods. This is supported also by the increasing need for sustainable practices in societies. However, in more daunting futures the lack of closed cycles will lead to shortages in resources as well as the lack of wellbeing in communities without access to sanitation. Thus, the research of sustainable sanitation solution is significant and necessary – also in the future.

General information
Publication status: Published
MoE publication type: G4 Doctoral dissertation (monograph)
Organisations: Department of Chemistry and Bioengineering
Contributors: O'Neill, M.
Number of pages: 236
Publication date: 7 Mar 2015

Publication information
Publisher: Tampere University of Technology
ISBN (Print): 978-952-15-3467-6
ISBN (Electronic): 978-952-15-3472-0
Original language: English

Publication series
Name: Tampere University of Technology. Publication
Publisher: Tampere University of Technology
Volume: 1284
ISSN (Print): 1459-2045
Electronic versions:

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URLs:

http://urn.fi/URN:ISBN:978-952-15-3472-0

Bibliographical note
INT=keb,"O'Neill,Mia"

Awarding institution:Tampereen teknillinen yliopisto - Tampere University of Technology
Submitter:Submitted by Kaisa Kulkki (kaisa.kulkki@tut.fi) on 2015-02-17T12:35:27Z
No. of bitstreams: 1
o'neill_1284.pdf: 3364317 bytes, checksum: 78eac8bfe0a42d2087dd7e78192f6216 (MD5)
Submitter:Approved for entry into archive by Kaisa Kulkki (kaisa.kulkki@tut.fi) on 2015-02-18T07:10:07Z (GMT) No. of bitstreams: 1
o'neill_1284.pdf: 3364317 bytes, checksum: 78eac8bfe0a42d2087dd7e78192f6216 (MD5)
Submitter:Made available in DSpace on 2015-02-18T07:10:07Z (GMT). No. of bitstreams: 1
o'neill_1284.pdf: 3364317 bytes, checksum: 78eac8bfe0a42d2087dd7e78192f6216 (MD5)
Source: researchoutputwizard
Source ID: 123456789/22778
Research output: Book/Report › Doctoral thesis › Monograph

Economic analysis of hydrogen production by methane thermal decomposition: Comparison to competing technologies
This study is a comparative analysis of hydrogen production costs in current and potential future market environments. The economic feasibility of hydrogen production by thermal decomposition of methane was compared to two other technologies, namely steam methane reforming and water electrolysis. According to the results, thermal decomposition of methane would be most suited for on-site demand-driven hydrogen production in small or medium industrial scale. Hydrogen production by thermal decomposition of methane would be economically competitive with steam reforming with a product carbon value of at least 280-310 EUR/tonne. By contrast, the main benefit of thermal decomposition of methane in comparison with water electrolysis is the feedstock availability via the current natural gas infrastructure, whereas electrolysis is highly dependent on the cost and availability of renewable electricity. The major factors affecting the

economic feasibility were identified as product carbon value in thermal decomposition of methane, natural gas cost in steam reforming, and electricity cost in electrolysis. Thus, the effect of these variables on the hydrogen production costs was analyzed. Additionally, the specific carbon dioxide emissions in hydrogen production by thermal decomposition of methane (40 kgCO2/MWhH2) were found to be much less that by steam reforming coupled with carbon dioxide capture from the syngas (133 kgCO2/MWhH2).

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Chemistry and Bioengineering, Research group: Bio- and Circular Economy
Contributors: Keipi, T., Tolvanen, H., Konttinen, J.
Number of pages: 10
Pages: 264-273
Publication date: 1 Mar 2018
Peer-reviewed: Yes

Publication information
Journal: Energy Conversion and Management
Volume: 159
ISSN (Print): 0196-8904
Ratings:

Scopus rating (2018): CiteScore 12.4 SJR 2.73 SNIP 2.181
Original language: English
Keywords: Methane decomposition, hydrogen, economic analysis, carbon dioxide emissions
DOIs:

10.1016/j.enconman.2017.12.063
Research output: Contribution to journal › Article › Scientific › peer-review

Editorial

General information
Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Civil Engineering
Contributors: Länsivaara, T.
Number of pages: 1
Publication date: 17 Dec 2018
Peer-reviewed: No

Publication information
Journal: Environmental Geotechnics
Volume: 5
Issue number: 6
ISSN (Print): 2051-803X
Ratings:

Scopus rating (2018): CiteScore 3.4 SJR 0.602 SNIP 0.899
Original language: English
ASJC Scopus subject areas: Environmental Engineering, Environmental Chemistry, Water Science and Technology, Geotechnical Engineering and Engineering Geology, Waste Management and Disposal, Geochemistry and Petrology, Nature and Landscape Conservation, Management, Monitoring, Policy and Law
DOIs:

10.1680/jenge.2018.5.6.309
Source: Scopus
Source ID: 85059019429
Research output: Contribution to journal › Editorial › Scientific

Editorial. Central role of water in society and community

General information
Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Department of Chemistry and Bioengineering
Contributors: Katko, T.
Pages: 8-11

Publication date: 2011
Peer-reviewed: No

Publication information
Journal: Ympäristöhistoria: Finnish Journal of Environmental History
Volume: 1
Issue number: 2
ISSN (Print): 1799-6953
Original language: English
URLs:

http://www.uta.fi/yky/tutkimus/historia/projektit/iehg/Ymparistohistoria/No0211/Yfjeh022011.pdf

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Publisher name: International Environmental History Group (IEHG)
Source: researchoutputwizard
Source ID: 6325
Research output: Contribution to journal › Article › Scientific

Editorial Note: "Pasts and Futures of Water"

General information
Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Department of Chemistry and Bioengineering, Former organisation of the author
Contributors: Juuti, P. S., Katko, T. S., Vinnari, E. M.
Pages: 167-171
Publication date: 2010
Peer-reviewed: No

Publication information
Journal: Environment and History
Volume: 16
Issue number: a
ISSN (Print): 0967-3407
Ratings:

Scopus rating (2010): SJR 0.195 SNIP 0.93
Original language: English
DOIs:

10.3197/096734010X12699419057214

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 8246
Research output: Contribution to journal › Article › Scientific

Editorial to “The best papers from the 32nd International Symposium on Automation and Robotics in Construction and Mining (ISARC 2015)”

General information
Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Department of Civil Engineering, Research group: Responsible Construction, Univ of Oulu
Contributors: Malaska, M., Heikkilä, R.
Number of pages: 1
Pages: 1
Publication date: 1 Nov 2016
Peer-reviewed: No

Publication information
Journal: Automation in Construction
Volume: 71
ISSN (Print): 0926-5805
Ratings:

Scopus rating (2016): CiteScore 7.8 SJR 1.395 SNIP 2.754
Original language: English
ASJC Scopus subject areas: Control and Systems Engineering, Civil and Structural Engineering, Building and Construction
DOIs:
10.1016/j.autcon.2016.08.045
Source: Scopus
Source ID: 84988322453
Research output: Contribution to journal › Editorial › Scientific

Education, Research and Capacity Building for Water Services

General information
Publication status: Published
Organisations: Department of Chemistry and Bioengineering
Contributors: Katko, T.
Publication date: 20 Sep 2012
Peer-reviewed: Unknown
Event: Paper presented at UNESCO Chair in Sustainable Water Services (UNECWAS) seminar 2012, 20.9.2012, Tampere, Finland, .
Research output: Other conference contribution › Paper, poster or abstract › Scientific

Effect of geometrical parameters on vortex-induced vibration of a splitter plate

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Pärssinen, T., Eloranta, H., Saarenrinne, P.
Number of pages: 9
Pages: 1-9
Publication date: 2009
Peer-reviewed: Yes

Publication information
Journal: Journal of Fluids Engineering: Transactions of the ASME
Volume: 131
Issue number: 3, 031203
ISSN (Print): 0098-2202
Ratings:
Scopus rating (2009): SJR 0.546 SNIP 1.039
Original language: English
DOIs:
10.1115/1.2844584

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 11068
Research output: Contribution to journal › Article › Scientific › peer-review

Effect of heavy metal co-contaminants on selenite bioreduction by anaerobic granular sludge
This study investigated bioreduction of selenite by anaerobic granular sludge in the presence of heavy metals and analyzed the fate of the bioreduced selenium and the heavy metals. Selenite bioreduction was not significantly inhibited in the presence of Pb(II) and Zn(II). More than 92% of 79 mg/L selenite was removed by bioreduction even in the presence of 150 mg/L of Pb(II) or 400 mg/L of Zn(II). In contrast, only 65-48% selenite was bioreduced in the presence of 150-400 mg/L Cd(II). Formation of elemental selenium or selenide varied with heavy metal type and concentration. Notably, the majority of the bioreduced selenium (70-90% in the presence of Pb and Zn, 50-70% in the presence of Cd) and heavy metals (80-90% of Pb and Zn, 60-80% of Cd) were associated with the granular sludge. The results have implications in the treatment of selenium wastewaters and biogenesis of metal selenides.

General information
Publication status: Published

MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, UPEM, Bhabha Atomic Research Centre, Environmental Engineering and Water Technology Department, UNESCO-IHE Institute for Water Education
Contributors: Mal, J., Nancharaiah, Y. V., van Hullebusch, E. D., Lens, P. N. L.
Number of pages: 8
Pages: 1-8
Publication date: 1 Apr 2016
Peer-reviewed: Yes

Publication information
Journal: Bioresource Technology
Volume: 206
ISSN (Print): 0960-8524
Ratings:

Scopus rating (2016): CiteScore 9.9 SJR 2.215 SNIP 1.945
Original language: English
ASJC Scopus subject areas: Bioengineering, Environmental Engineering, Waste Management and Disposal
Keywords: Anaerobic granular sludge, Biosorption, Heavy metal removal, Metal selenide, Selenite bioreduction
DOIs:

10.1016/j.biortech.2016.01.064
Source: Scopus
Source ID: 84961305364
Research output: Contribution to journal › Article › Scientific › peer-review

Effect of HRT on nitrogen recovery from real reject water in a 3-chamber bioelectroconcentration cell

General information
Publication status: Published
MoE publication type: Not Eligible
Organisations: Materials Science and Environmental Engineering, Research group: Bio- and Circular Economy, University of Queensland
Contributors: Koskue, V., Rinta-Kanto, J., Ledezma, P., Freguia, S., Kokko, M.
Publication date: 7 Oct 2019
Peer-reviewed: Unknown
Event: Paper presented at ISMET 7, Okinawa, Japan.
Research output: Other conference contribution › Paper, poster or abstract › Scientific

Effect of N/S ratio on anoxic sulfide oxidizing bioreactors

Hydrogen sulfide (H2S) removal from biogas using anoxic bioprocesses are economic and efficient compared to physico-chemical H2S removal or other biogas upgrading technologies. Most of these biotechnologies have used nitrate-reducing, sulfide-oxidizing bacteria (NR-SOB) as the dominant microorganism for H2S removal. Anoxic sulfide removal technologies have been widely applied for both liquid and gaseous pollutants, particularly for biogas clean-up, because it is more practically applicable than the conventional aerobic systems in terms of ease of use and operational costs (Almenglo et al. 2016; Fernández et al. 2014; Soreanu et al., 2008). In this study, the performance of an attached growth bioreactor, i.e. a fluidized bed reactor (FBR) and a combined attached and suspended growth bioreactor, i.e. a moving bed bioreactor (MBBR), were tested under different operating conditions and the bioreactors were compared for their ability to perform sulfur oxidation coupled to autotrophic denitrification.In anoxic sulfide-oxidizing reactors, a crucial factor is the nitrogen/sulfur (N/S) ratio, which affects the metabolism of nitrate-reducing, sulfide-oxidizing bacteria (NR-SOB) and the ratio of the end products of sulfide oxidation such as elemental sulfur and sulfate. Thus, the objective of this study was to evaluate the effect of the N/S ratio on the thiosulfate removal efficiency in two different anoxic biofilm bioreactors, i.e. a MBBR and a FBR, as shown in Figure 1. Both the lab-scale MBBR and FBR were operated for 250 days, at room temperature (~20 ºC) and at a feed pH of 7.0 ± 0.2. The dissolved oxygen (DO) concentrations in the MBBR and FBR were 0.51 ± 0.09 and 0.26 ± 0.06 mg L-1, respectively. The FBR used in this study was previously used for thiosulfate-driven denitrification (Di Capua et al. 2017). The MBBR was inoculated by using the biomass obtained from that FBR containing Thiobacillus denitrificans as the dominant microorganism. The performance of the MBBR and FBR were evaluated under three different N/S ratios (0.5, 0.3 and 0.1). Thiosulfate was used as a substrate for sulfide-oxidizing bacteria at a constant concentration of 200 mg S-S2O32- L-1, whereas the concentration of the electron acceptor, nitrate, was decreased stepwise from 40 to 10 mg N-NO3- L-1. The performances of the MBBR and FBR can be compared in Table 1. The removal efficiency of thiosulfate was > 98% and nitrate was completely consumed during the operational time in both bioreactors at N/S ratio of 0.5. Under the nitrate-limiting conditions tested, i.e. N/S ratio of 0.3 and 0.1, the thiosulfate removal efficiencies in the MBBR (83.4 and 37.8%) were higher than those observed in the FBR (77.8 and 26.1%), resulting in a higher sulfate production.The higher DO concentrations observed in the MBBR compared to the FBR likely played a role in enhancing thiosulfate oxidation due to T. denitrificans, a dominant microorganism in the inoculum, being a facultative anaerobe which enables to use oxygen as alternative e- acceptor to oxidize the thiosulfate.

Additionally, it was probably because of the different bioreactor configuration and mixing conditions.

Conclusions

The MBBR and FBR can be operated at room temperature (~20 ºC) for achieving high removal efficiencies of thiosulfate (> 98%), under autotrophic denitrification conditions, at a HRT of 5 h, feed pH of 7 and a N/S ratio of 0.5. However, the MBBR resulted in higher thiosulfate oxidation rates than the FBR after the nitrate-limiting conditions were applied. The reactor performance at a N/S ratio of 0.1 and the evaluation of the microbial community composition at different N/S ratios require further investigation.

General information

Publication status: Published
Organisations: Chemistry and Bioengineering, Research group: Bio- and Circular Economy, Department of civil and Mechanical Engineering, University of Cassino and Southern Lazio, UNESCO-IHE Institute for Water Education, Delft
Contributors: Khanongnuch, R., Di Capua, F., Lakaniemi, A., R. Rene, E., Lens, P. N. L.
Publication date: 19 Jul 2017
Peer-reviewed: Unknown
Event: Paper presented at Biotechniques 2017, La Coruña, Spain.
Keywords: Biological desulfurization, Sulfide oxidizing bacteria (SOB), Autotrophic denitrification, Moving bed biofilm reactor (MBBR), Fluidized bed biofilm reactor (FBR)
Additional files:

Biotechnique Poster_Ramita
Research output: Other conference contribution › Paper, poster or abstract › Scientific

Effect of particle size and dispersion status on cytotoxicity and genotoxicity of zinc oxide in human bronchial epithelial cells

Data available on the genotoxicity of zinc oxide (ZnO) nanoparticles (NPs) are controversial. Here, we examined the effects of particle size and dispersion status on the cytotoxicity and genotoxicity of nanosized and fine ZnO, in the presence and absence of bovine serum albumin (BSA; 0.06%) in human bronchial epithelial BEAS-2B cells. Dynamic light scattering analysis showed the most homogenous dispersions in water alone for nanosized ZnO and in water with BSA for fine ZnO. After a 48-h treatment, both types of ZnO were cytotoxic within a similar, narrow dose range (1.5-3.0 μg/cm^2) and induced micronuclei at a near toxic dose range (1.25-1.75 μg/cm^2), both with and without BSA. In the comet assay, nanosized ZnO (1.25-1.5 μg/cm^2), in the absence of BSA, caused a statistically significant increase in DNA damage after 3-h and 6-h treatments, while fine ZnO did not. Our findings may be explained by better uptake or faster intracellular dissolution of nanosized ZnO without BSA during short treatments (3-6 h; the comet assay), with less differences between the two ZnO forms after longer treatments (>48 h; the in vitro micronucleus test). As ZnO is genotoxic within a narrow dose range partly overlapping with cytotoxic doses, small experimental differences e.g. in the dispersion of ZnO particles may have a substantial effect on the genotoxicity of the nominal doses added to the cell culture.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Materials Science, Research group: Materials Characterization, Nofer Institute of Occupational Medicine, University of Zaragoza, Finnish Institute of Occupational Health
Contributors: Roszak, J., Catalán, J., Järventaus, H., Lindberg, H. K., Suhonen, S., Vippola, M., Stepnik, M., Norppa, H.
Number of pages: 12
Pages: 7-18
Publication date: 1 Jul 2016
Peer-reviewed: Yes

Publication information

Journal: Mutation Research: Genetic Toxicology and Environmental Mutagenesis
Volume: 805
ISSN (Print): 1383-5718
Ratings:

Scopus rating (2016): CiteScore 4.5 SJR 0.927 SNIP 0.972
Original language: English
ASJC Scopus subject areas: Health, Toxicology and Mutagenesis, Genetics
Keywords: DNA damage, Genotoxicity, Micronucleus, Nanoparticle, Zinc oxide
DOIs:

10.1016/j.mrgentox.2016.05.008
Source: Scopus
Source ID: 84973346011
Research output: Contribution to journal › Article › Scientific › peer-review

Effect of Temperature on Fume Formation and Deposition in Kraft Recovery Boilers - a Modeling Approach

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Chemistry and Bioengineering, Research group: Power Plant and Combustion Technology, University of Toronto, Canada, Valmet Technologies Oy
Contributors: Leppänen, A., Tran, H., Välimäki, E., Oksanen, A.
Number of pages: 10
Pages: 38-47
Publication date: 2014

Host publication information
Title of host publication: 2014 International Chemical Recovery Conference, Proceedings - Volume 2
Publisher: Suomen Soodakattilayhdistys, The Finnish Recovery Boiler Committee; TAPPI
Editors: Nieminen, M., Lampinen, P.
ISBN (Print): 978-952-68166-0-9
ISBN (Electronic): 978-952-28166-1-6

Bibliographical note
2014 International Chemical Recovery Conference, 9-12 June, 2014, Tampere, Finland
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-06-27
Publisher name: Suomen Soodakattilayhdistys, The Finnish Recovery Boiler Committee; TAPPI
Source: researchoutputwizard
Source ID: 923
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Effect of Tissue Conductivity on Internal Body Resistances of Numerical Human Model at Power Frequency

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Tarao, H., Hayashi, N., Korpinen, L., Gonzalez, J. A., Matsumoto, T., Isaka, K.
Pages: 197-199
Publication date: 2012

Host publication information
Title of host publication: The Bioelectromagnetics Society 34th Annual Meeting, June 17, 2012 - June 22, 2012, Brisbane, Australia
Publisher: The Bioelectromagnetics Society
ISBN (Print): 978-0-646-57844-6

Publication series
Name: The Bioelectromagnetics Society Annual Meeting
URLs:

http://www.bems.org

Bibliographical note
Contribution: organisation=epr,FACT1=1
Publisher name: The Bioelectromagnetics Society
Source: researchoutputwizard
Source ID: 5403
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Effects of tissue conductivity and electrode area on internal electric fields in a numerical human model for ELF contact current exposures

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Tarao, H., Kuisti, H., Korpinen, L., Hayashi, N., Isaka, K.
Publication date: 2012
Peer-reviewed: Yes

Publication information
Journal: Physics in Medicine and Biology

Volume: 57
Issue number: 10
ISSN (Print): 0031-9155
Ratings:

Scopus rating (2012): CiteScore 5.5 SJR 1.592 SNIP 1.719
Original language: English
DOIs:

10.1088/0031-9155/57/10/2981
URLs:

http://iopscience.iop.org/0031-9155/57/10/2981

Bibliographical note
Contribution: organisation=epr,FACT1=1
Publisher name: Institute of Physics Publishing Ltd.
Source: researchoutputwizard
Source ID: 5404
Research output: Contribution to journal › Article › Scientific › peer-review

Electricity generation from tetrathionate in microbial fuel cells by acidophiles

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Urban circular bioeconomy (UrCirBio)
Contributors: Sulonen, M. L., Kokko, M. E., Lakaniemi, A., Puhakka, J. A.
Number of pages: 8
Pages: 182-189
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Journal of Hazardous Materials
Volume: 284
ISSN (Print): 0304-3894
Ratings:

Scopus rating (2015): CiteScore 9 SJR 1.633 SNIP 1.948
Original language: English
DOIs:

10.1016/j.jhazmat.2014.10.045

Bibliographical note
Available online 3 November 2014 : Volume 284, 2 March 2015, Pages 182-189
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-12-12
Source: researchoutputwizard
Source ID: 1560
Research output: Contribution to journal › Article › Scientific › peer-review

Electricity production by a microbial fuel cell fueled by brewery wastewater and the factors in its membrane deterioration

Electricity production from brewery wastewater using dual-chamber microbial fuel cells (MFCs) with a tin-coated copper mesh in the anode was investigated by changing the hydraulic retention time (HRT). The MFCs were fed with wastewater samples from the inlet (inflow, MFC-1) and outlet (outflow, MFC-2) of an anaerobic digester of a brewery wastewater treatment plant. Both chemical oxygen demand removal and current density were improved by decreasing HRT. The best MFC performance was with an HRT of 0.5 d. The maximum power densities of 8.001 and 1.843 μW/cm² were obtained from reactors MFC-1 and MFC-2, respectively. Microbial diversity at different conditions was studied using PCR-DGGE profiling of 16S rRNA fragments of the microorganisms from the biofilm on the anode electrode. The MFC reactor had mainly Geobacter, Shewanella, and Clostridium species, and some bacteria were easily washed out at lower HRTs. The fouling characteristics of the MFC Nafion membrane and the resulting degradation of MFC performance were examined. The ion exchange capacity, conductivity, and diffusivity of the membrane decreased significantly after fouling. The morphology of the Nafion membrane and MFC degradation were studied using scanning electron microscopy and attenuated total reflection-Fourier transform infrared spectroscopy.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Portland State University, Department of Civil and Environmental Engineering, Yildiz Technical University

Contributors: Çetinkaya, A. Y., Köroğlu, E. O., Demir, N. M., Baysoy, D. Y., Özkaya, B., Çakmakçi, M.
Number of pages: 9
Pages: 1068-1076
Publication date: 20 Jul 2015
Peer-reviewed: Yes

Publication information
Journal: Chinese Journal of Catalysis
Volume: 36
Issue number: 7
ISSN (Print): 0253-9837
Ratings:

Scopus rating (2015): CiteScore 3.4 SJR 0.579 SNIP 0.805
Original language: English
ASJC Scopus subject areas: Catalysis, Chemistry(all)
Keywords: Anaerobic processe, Biofilm, Microbial community, Microbial fuel cell, Wastewater treatment
DOIs:

10.1016/S1872-2067(15)60833-6
URLs:

http://www.scopus.com/inward/record.url?scp=84934932934&partnerID=8YFLogxK (Link to publication in Scopus)

Bibliographical note
EXT="Çakmakçi, Mehmet"
Source: Scopus
Source ID: 84934932934
Research output: Contribution to journal › Article › Scientific › peer-review

Elimination of arsenic-containing emissions from gasification of chromated copper arsenate wood
The behavior of arsenic in chromated copper arsenate containing wood during gasification was modeled using thermodynamic equilibrium calculations. The results of the model were validated using bench-scale gasification tests. It is shown that over 99.6% of arsenic can be removed from the product gas by a hot filter when the gas is cooled below the predicted condensation temperature.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Energy Technology and Thermal Process Chemistry, Gasification Technologies Inc., Gas Technology Institute
Contributors: Kramb, J., Konttinen, J., Backman, R., Salo, K., Roberts, M.
Number of pages: 6
Pages: 319-324
Publication date: 1 Oct 2016
Peer-reviewed: Yes

Publication information
Journal: Fuel
Volume: 181
ISSN (Print): 0016-2361
Ratings:

Scopus rating (2016): CiteScore 7.8 SJR 1.736 SNIP 2.206
Original language: English
ASJC Scopus subject areas: Fuel Technology, Energy Engineering and Power Technology, Chemical Engineering(all), Organic Chemistry
Keywords: Arsenic, CCA wood, Equilibrium modeling, Gasification
DOIs:

10.1016/j.fuel.2016.04.109
Source: Scopus
Source ID: 84965081806
Research output: Contribution to journal › Article › Scientific › peer-review

Enabling and Integrative Infrastructure Policy: The Role of Inverse Infrastructures in Local Infrastructure Provision with Special Reference to Finnish Water Cooperatives
Infrastructures are necessary to support the functionality of urban communities. Globalization, increased polycentricity, new trends in governance and tightening public budgets have increased interest in alternative ways of providing such

infrastructures. One product of this trend is the ‘inverse infrastructure,’ which refers to a modularized, semi-autonomous and user-driven infrastructure that is a result of the self-organization of local actors. In this study, we discuss the nature of such infrastructures and the challenges they pose to local infrastructure policy with special reference to the case of water cooperatives in Finland. Our conclusion is that inverse infrastructures have a potential to contribute to local infrastructure services either as cost-effective alternative or as supplement to large technical systems. Their full utilization requires, however, enabling and integrative infrastructure policy.

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Department of Chemistry and Bioengineering, University of Tampere
Contributors: Heino, O., Anttiroiko, A.
Publication date: 28 Nov 2014

Publication information
Publisher: MPRA
Original language: English

Publication series
Name: MPRA Paper
No.: 60276
Keywords: Infrastructure, Infrastructure policy, Public policy , Local government , Inverse infrastructure, Complex adaptive system, Adaptation, Self-Organization, Resilience, Volunteering, Water services, Water cooperative, Finland
URLs:

https://mpra.ub.uni-muenchen.de/60276/
Research output: Book/Report › Commissioned report › Professional

Energistä utopiaa?

General information
Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Civil Engineering, Research group: Capacity Development of Water and Environmental Services CADWES
Contributors: Sorri, J.
Number of pages: 2
Pages: 38-39
Publication date: 2017
Peer-reviewed: No

Publication information
Journal: Futura
Volume: 36
Issue number: 1
ISSN (Print): 0785-5494
Original language: Finnish
Research output: Contribution to journal › Book/Film/Article review › Scientific

Engineering and kinetic aspects of bacterial uranium reduction for the remediation of uranium contaminated environments

Biological reduction of soluble uranium from U(VI) to insoluble U(IV) coupled to the oxidation of an electron donor (hydrogen or organic compounds) is a potentially cost-efficient way to reduce the U concentrations in contaminated waters to below regulatory limits. A variety of microorganisms originating from both U contaminated and non-contaminated environments have demonstrated U(VI) reduction capacity under anaerobic conditions. Bioreduction of U(VI) is considered especially promising for in situ remediation, where the activity of indigenous microorganisms is stimulated by supplying a suitable electron donor to the subsurface to contain U contamination to a specific location in a sparingly soluble form. Less studied microbial biofilm-based bioreactors and bioelectrochemical systems have also shown potential for efficient U(VI) reduction to remove U from contaminated water streams. This review compares the advantages and challenges of U(VI)-reducing in situ remediation processes, bioreactors and bioelectrochemical systems. In addition, the current knowledge of U(VI) bioreduction mechanisms and factors affecting U(VI) reduction kinetics (e.g. pH, temperature, and the chemical composition of the contaminated water) are discussed, as both of these aspects are important in designing efficient remediation processes.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Materials Science and Environmental Engineering, Research group: Bio- and Circular Economy

Contributors: Lakaniemi, A., Douglas, G. B., Kaksonen, A. H.
Pages: 198 - 212
Publication date: 5 Jun 2019
Peer-reviewed: Yes

Publication information
Journal: Journal of Hazardous Materials
Volume: 371
ISSN (Print): 0304-3894
Ratings:

Scopus rating (2019): CiteScore 13.1 SJR 2.01 SNIP 2.159
Original language: English
Keywords: Uranium, remediation, Bioreactor, Bioelectrochemical system, Biofilm, Reduction rate
DOIs:

10.1016/j.jhazmat.2019.02.074

Bibliographical note
EXT="Kaksonen, Anna H."
Source: Bibtex
Source ID: LAKANIEMI2019198
Research output: Contribution to journal › Article › Scientific › peer-review

Enhancement in Lifespan of Halide Perovskite Solar Cells
While perovskite solar cells have skyrocketed in recent years to power conversion efficiencies competitive with those of silicon and thin-film photovoltaics, the lagged behind stability stands in the way of commercialisation. In this review, we discuss the reasons and factors that induce the degradation in photovoltaic performance of perovskite solar cells, and furthermore, we summarise the most promising strategies to enhance the lifespan. We show that each component of the device, including charge selective contacts, perovskite layer, and electrodes, can be engineered to reduce the influence of heat, UV light, oxygen, moisture and their synergetic effect on the operating lifetime of devices. We conclude that inorganic contacts and inorganic perovskite compositions are the most promising direction toward stable perovskite solar cells.

General information
Publication status: Published
MoE publication type: A2 Review article in a scientific journal
Organisations: Chemistry and Bioengineering, Research group: Chemistry & Advanced Materials, Helmholtz Zentrum Berlin Mat & Energie, Helmholtz Association, Helmholtz-Zentrum Berlin (HZB), Sapienza University, Institute of Advanced Energy Materials, Fuzhou University, Fuzhou, Fujian 350002, China., Department of Chemical, Materials and Production Engineering, University of Naples Federico II, Piazzale Tecchio 80, 80125 Fuorigrotta, Naples Italy
Contributors: Wang, Q., Phung, N., Di Girolamo, D., Vivo, P., Abate, A.
Pages: 865-886
Publication date: Mar 2019
Peer-reviewed: Yes
Early online date: 7 Dec 2018

Publication information
Journal: Energy & Environmental Science
Volume: 12
Issue number: 3
ISSN (Print): 1754-5692
Ratings:

Scopus rating (2019): CiteScore 56 SJR 13.024 SNIP 4.706
Original language: English
Keywords: perovskite solar cells, stability, lifetime
DOIs:

10.1039/C8EE02852D
Research output: Contribution to journal › Review Article › Scientific › peer-review

Ensimmäiset fuusiosuunnitelmat

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: University of Tampere

Contributors: Juuti, P., Rajala, R.
Pages: 39-76
Publication date: 2009

Host publication information
Title of host publication: Vesihuoltoyhteistyötä yli rajojen : PK-seudun yhteistyöhankkeet ja yhdistämissuunnitelmat ennen ja nyt Espoon näkökulmasta
Publisher: University of Tampere
Editors: Juuti, P., Rajala, R.
ISBN (Print): 978-951-857-559-0
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Environmental history of water: Global view of community water supply and sanitation

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P., Katko, T., Vuorinen, H.
Pages: 631-636
Publication date: 2006

Host publication information
Title of host publication: Symposium Preprint Book: 1st IWA International Symposium on Water and Wastewater Technologies in Ancient Civilizations, Iraklio, Greece, 27.10.2006

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 16568
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Environmental history of water : global views on community water supply and sanitation

General information
Publication status: Published
MoE publication type: C2 Edited books
Organisations: Bio- ja ympäristötekniikka, Department of Civil Engineering, Former organisation of the author
Contributors: Juuti, P. S. (ed.), Katko, T. S. (ed.), Vuorinen, H. S. (ed.)
Publication date: 2007

Publication information
Place of publication: London
Publisher: IWA Publishing
ISBN (Print): 978-1-84339-110-4
ISBN (Electronic): 1-84339-110-4
Original language: English

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14492
Research output: Book/Report › Anthology › Scientific › peer-review

Environmental impact of micropollutants present in urine

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Chemistry and Bioengineering
Contributors: Pynnönen, S., Tuhkanen, T.
Number of pages: 8
Pages: 1-8
Publication date: 2012

Host publication information
Title of host publication: Dry Toilet Conference 2012, 4th International Dry Toilet Conference, Full Papers, 22-24 August 2012, Tampere, Finland
Place of publication: Helsinki
Publisher: Global Dry Toilet Assciation of Finland

Publication series
Name: International Dry Toilet Conference
URLs:
http://www.drytoilet.org/dt2012/full_papers/4/Sanna_Pynnonen.pdf

Bibliographical note
ei ut-numeroa 28.8.2013
Contribution: organisation=keb bio,FACT1=1
Publisher name: Global Dry Toilet Assciation of Finland
Source: researchoutputwizard
Source ID: 5123
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Epilogue

General information
Publication status: Published
MoE publication type: C2 Edited books
Organisations: Department of Chemistry and Bioengineering, Former organisation of the author
Contributors: Juuti, P. S. (ed.), Katko, T. S. (ed.), Schwartz, K. (ed.)
Number of pages: 5
Publication date: 2013

Publication information
Publisher: IWA Publishing
ISBN (Print): 978-1-78040-022-8
ISBN (Electronic): 978-1-78040-073-0
Original language: English

Bibliographical note
Prologue r=1587
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-09-29
Source: researchoutputwizard
Source ID: 2441
Research output: Book/Report › Anthology › Scientific › peer-review

Epilogue: Local Solutions Based on Local Conditions

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P. S., Katko, T. S., Vuorinen, H. S.
Pages: 593-598
Publication date: 2007

Host publication information
Title of host publication: 2007. Environmental History of Water - Global views on community water supply and sanitation. IWA Publishing
Editors: Juuti P.S., K. T., Vuorinen, H.

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14497
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Erosion testing of filled and/or reinforced vinyl ester composites in water medium at elevated temperature

General information

Publication status: Published
MoE publication type: D3 Professional conference proceedings
Organisations: Department of Materials Science, Research group: Plastics and Elastomer Technology, Outotec Research Center
Contributors: Siljander, S., Kiviniemi, M., Sarlin, E., Lindgren, M., Suihkonen, R., Vuorinen, J.
Number of pages: 10
Publication date: 2015

Host publication information
Title of host publication: Proceedings of the 20th International Conference on Composite Materials
URLs:

http://iccm20.org/fullpapers/file?f=BJk14rEQqP

Bibliographical note
ISBN kysytty, ei löydy / TL
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Professional

E-sail test payload of the ESTCube-1 nanosatellite

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Envall, J., Janhunen, P., Toivanen, P., Pajusalu, M., Ilbis, E., Kalde, J., Averin, M., Kuuste, H., Laizans, K., Allik, V., Rauhala, T., Seppänen, H., Kiprich, S., Ukkonen, J., Haeggström, E., Kalvas, T., Tarvainen, O., Kauppinen, J., Nuottajärvi, A., Koivisto, H.
Number of pages: 12
Pages: 210-221
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Proceedings of the Estonian Academy of Sciences
Volume: 63
Issue number: 2S
ISSN (Print): 1736-6046
Ratings:

Scopus rating (2014): CiteScore 1 SJR 0.192 SNIP 0.575
Original language: English
DOIs:

10.3176/proc.2014.2S.02

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-05-22
Publisher name: Teaduste Akadeemia Kirjastus; Eesti Teaduste Akadeemia
Source: researchoutputwizard
Source ID: 285
Research output: Contribution to journal › Article › Scientific › peer-review

Espoo päättää siirtyä kärkipaikalle

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, University of Tampere
Contributors: Juuti, P., Rajala, R.
Pages: 73-76
Publication date: 2008

Host publication information
Title of host publication: Ei jätevedenpuhdistamoa minun takapihalleni : Jätevedenpuhdistuksen päätöksenteko, päätäntäprosessit ja julkinen keskustelu Espoossa historiassa, nyt ja tuelvaisuudessa
Publisher: TamPub
Editors: Juuti, P., Rajala, R.

ISBN (Print): 978-951-857-540-8
ISBN (Electronic): 978-951-44-7511-5
URLs:
http://urn.fi/urn:isbn:978-951-44-7511-5
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Evaluation of methods for enhancing methane oxidation via increased soil air capacity and nutrient content in simulated landfill soil cover

Landfill soil covers and methanotrophs therein have potential to act as final sinks of the greenhouse gas methane (CH4) generated in landfills, but soil characteristics in landfills might not support methanotrophic activity due to poor soil material selection or mineralisation over time. Hence, our aim was to determine the performance of mineral landfill soil under simulated CH4 flux and screen methods for elevating the CH4 elimination capacity (EC) of soil. The methods tested during the column experiment were inorganic fertilisation (nitrate, phosphate, sulphate, copper), decompaction and amelioration of the soil with compost. The addition of compost proved to be the most effective method for increasing the CH4 EC of soil, increasing from 55 to 189 g m-2 d-1 relative to the untreated control soil. This increase could be attributed to increased air capacity, concentration of soil nutrients and number of cultivable methanotrophs. Also, soil water-holding capacity was identified as a more crucial factor for methanotrophic activity than total porosity. Inorganic fertilisation and decompaction induced only a temporary increase in CH4 EC, likely resulting from the temporary supply of fertiliser to the nutrient-deprived soil. In conclusion, we suggest that compost amelioration (22 w-%) could be useful for restoring CH4 EC of old landfill covers as an aftercare action to control environmental impacts of closed landfills.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Chemistry and Bioengineering, Research group: Bio- and Circular Economy
Contributors: Maanoja, S., Rintala, J.
Number of pages: 11
Pages: 82-92
Publication date: 2018
Peer-reviewed: Yes

Publication information

Journal: Waste Management
Volume: 82
ISSN (Print): 0956-053X
Ratings:
Scopus rating (2018): CiteScore 8.2 SJR 1.523 SNIP 2.232
Original language: English
Keywords: Greenhouse gas, Methanotroph, Fertilisation, Compost, Water-holding capacity
DOIs:
10.1016/j.wasman.2018.10.015
Research output: Contribution to journal › Article › Scientific › peer-review

Evolution of Community-Managed Water Supply Projects From 1994 to the 2010s in Ethiopia

This article discusses the evolution of community-managed projects (CMPs) along with the global community-based management of water supply and sanitation services since the 1960s, particularly the evolution of Ethiopian water resources development in the last century. The study was conducted with intensive reviews of journals, reports, project documents, and discussions with the people involved in CMP implementation, including many Ethiopian government officials. The article presents the various development phases of the water and sanitation sector in Ethiopia together with national and global influences. Currently, in the 2010s, the CMP financing mechanisms and the national development of water supply and sanitation are more organized and integrated, and are in the stage of scaling up. The recently agreed national water, sanitation, and hygiene strategic framework is expected to have significant impacts on the rural water supply and sanitation development in Ethiopia.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Life Cycle Effectiveness of the Built Environment (LCE@BE), Department of Chemistry and Bioengineering , Community-Led Accelerated WASH (COWASH) Project
Contributors: Behailu, B. M., Suominen, A., Katko, T. S.
Number of pages: 22
Pages: 379-400
Publication date: 22 Oct 2015
Peer-reviewed: Yes

Early online date: 13 Jul 2015

Publication information
Journal: Public Works Management and Policy
Volume: 20
Issue number: 4
ISSN (Print): 1087-724X
Ratings:

Scopus rating (2015): CiteScore 0.9 SJR 0.242 SNIP 0.41
Original language: English
ASJC Scopus subject areas: Business, Management and Accounting (miscellaneous), Sociology and Political Science, Public Administration
Keywords: community-managed projects (CMP), Ethiopia, evolution, sustainability, water sector reforms
DOIs:

10.1177/1087724X15593955
Source: Scopus
Source ID: 84942086997
Research output: Contribution to journal › Article › Scientific › peer-review

Examples of occupational ELF electric and magnetic field exposure in Finland

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Alanko, T., Pääkkönen, R., Lahtinen, S., Korpinen, L.
Number of pages: 2
Pages: 1-2
Publication date: 2011

Host publication information
Title of host publication: 10th International Conference European Bioelectromagnetics Association, 21-24 February 2011, Rome, Italy
Place of publication: Rome
Publisher: European Bioelectromagnetics Association
ISBN (Print): 978-88-8286-231-2

Publication series
Name: International Conference European Bioelectromagnetics Association
Publisher: European Bioelectromagnetics Association
URLs:

http://proceedings.ebea2011.org/modules/request4b6d.pdf?module=oc_program&action=view.php&id=5262

Bibliographical note
ei ut-numeroa 19.10.2013
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 5679
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Examples of using the moodle virtual learning environment for teaching technical university students

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L., Gonzalez-Sosa, J., Tepsa, K.
Pages: 981-990
Publication date: 2012

Host publication information
Title of host publication: EDULEARN12 Proceedings, 4th International Conference on Education and New Learning Technologies, 2-4 July, 2012, Barcelona, Spain
Place of publication: Barcelona
Publisher: International Association of Technology, Education and Development IATED

Editors: Gomez Chova, L., Candel Torres, I., Lopez Martinez, A.
ISBN (Print): 978-84-695-3491-5

Publication series
Name: International Conference on Education and New Learning Technologies

Bibliographical note
ei ut-numeroa 19.8.2013
Contribution: organisation=epr,FACT1=1
Publisher name: International Association of Technology, Education and Development IATED
Source: researchoutputwizard
Source ID: 4529
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Examples to Reduce the EMF Generated by HV Power Transmission Lines of Different Design

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Okun, A., Korpinen, L.
Publication date: 2012

Host publication information
Title of host publication: Proceedings - 7th International Workshop on Biological Effects of Electromagnetic Fields, 7th IWSBEEMF, 8 - 12 October 2012, Valletta, Malta
Publisher: Electromagnetic Research Group - EMRG (Malta); Departmet of Physics, University of Malta
ISBN (Print): 978-99957-0-361-5

Publication series
Name: International Workshop on Biological Effects of Electromagnetic Fields
URLs:

http://www.um.edu.mt/events/emf2012/proceedings

Bibliographical note
ei ut-numeroa 27.8.2013
Contribution: organisation=epr,FACT1=1
Publisher name: Electromagnetic Research Group - EMRG (Malta); Departmet of Physics, University of Malta
Source: researchoutputwizard
Source ID: 4979
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Expanding rural water supplies in historical perspective: Six cases from Finland and South Africa

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P., Katko, T., Mäki, H., Toivio, H.
Pages: 355-380
Publication date: 2007

Host publication information
Title of host publication: Environmental History of Water - Global views on community water supply and sanitation
Editors: Juuti, P., Katko, T., Vuorinen, H.

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14489
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Experiences of integrating MSc student research projects in the "electromagnetic fields and health" area

General information
Publication status: Published

MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L., Pääkkönen, R., Gonzalez-Sosa, J., Gobba, F.
Pages: 1007-1010
Publication date: 2012

Host publication information
Title of host publication: EDULEARN12 Proceedings, 4th International Conference on Education and New Learning Technologies, 2-4 July, 2012, Barcelona, Spain
Place of publication: Barcelona
Publisher: International Association of Technology, Education and Development IATED
Editors: Gomez Chova, L., Candel Torres, I., Lopez Martinez, A.
ISBN (Print): 978-84-695-3491-5

Publication series
Name: International Conference on Education and New Learning Technologies

Bibliographical note
ei ut-numeroa 19.8.2013
Contribution: organisation=epr,FACT1=1
Publisher name: International Association of Technology, Education and Development IATED
Source: researchoutputwizard
Source ID: 4536
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Experimental study of oxy-fuel combustion in a drop tube reactor

General information
Publication status: Published
MoE publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Energy and Process Engineering
Contributors: Rodriguez, A. M., Raiko, R.
Number of pages: 11
Pages: 1-11
Publication date: 2010

Host publication information
Title of host publication: AFRC 2010 Pacific Rim Combustion Symposium, September 26-29, 2010 Sheraton Maui, Hawaii

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 9124
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific

Exposure to electric and magnetic fields at 110 kV substation while performing the task ‘Changing a bulb from a man hoist’ in the Tampere region

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Pääkkönen, R., Holm, A., Korpinen, L.
Number of pages: 2
Pages: 1-2
Publication date: 2010

Host publication information
Title of host publication: Bioelectromagnetics Society 32nd Annual Meeting (BEMS), June 14-18, 2010, Seoul, Korea
URLs:

http://www.bioelectromagnetics.org/bems2010/

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 8922

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Exposure to Extremely Low Frequency Magnetic Fields: a Personal Monitoring Study in a Large Group of Workers

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Gobba, F., Rossi, P., Contessa, G. M., Korpinen, L.
Pages: 63-64
Publication date: 2012

Host publication information
Title of host publication: II National Conference ICEmB 27.-29.6.2012, Bologna, Italy
Place of publication: Genova
Publisher: The Inter-university research Centre into Interactions between Electromagnetic fields and Biosystems ICEmB

Publication series
Name: National Conference ICEmB
URLs:
http://www.icemb.org/bologna/dosimetria/DOS4_GobbaICEmB_BO12def.pdf
http://www.icemb.org/bologna/html/Dosimetria.html

Bibliographical note
ei ut-numeroa 13.8.2013
Contribution: organisation=epr,FACT1=1
Publisher name: The Inter-university research Centre into Interactions between Electromagnetic fields and Biosystems ICEmB
Source: researchoutputwizard
Source ID: 4094
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Exposure to indoor air pollution across socio-economic groups in high-income countries: A scoping review of the literature and a modelling methodology
Disparities in outdoor air pollution exposure between individuals of differing socio-economic status is a growing area of research, widely explored in the environmental health literature. However, in developed countries, around 80% of time is spent indoors, meaning indoor air pollution may be a better proxy for personal exposure. Building characteristics - such as build quality, volume and ventilation - and occupant behaviour, mean indoor air pollution may also vary across socio-economic groups, leading to health inequalities. Much of the existing literature has focused on inequalities in exposure to outdoor air pollution, and there is thus a lack of an evidence base reviewing data for indoor environments. In this study, a scoping review of the literature on indoor air pollution exposures across different socio-economic groups is performed, examining evidence from both monitoring and modelling studies in the developed world. The literature was reviewed, identifying different indoor pollutants, definitions for socio-economic status and pre- and post- housing interventions. Based on the review, the study proposes a modelling methodology for evaluating the effects of environmental policies on different socio-economic populations. Using a sample size calculation, obstacles in obtaining sufficiently large samples of monitored data are demonstrated. A modelling framework for the rapid quantification of daily home exposure is then outlined as a proof of concept. While significant additional research is required to examine inequalities in indoor exposures, modelling approaches may provide opportunities to quantify exposure disparities due to housing and behaviours across populations of different socio-economic status.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: UCL Energy Institute, UCL Institute for Environmental Design & Engineering, University College London, London, UK., PHE, University College London, Public Health England, University College of London
Contributors: Ferguson, L., Taylor, J., Davies, M., Shrubsole, C., Symonds, P., Dimitroulopoulou, C.
Publication date: Oct 2020
Peer-reviewed: Yes

Publication information
Journal: Environment International
Volume: 143
Article number: 105748
ISSN (Print): 0160-4120
Original language: English
DOIs:

10.1016/j.envint.2020.105748
Research output: Contribution to journal › Article › Scientific › peer-review

Factors affecting the elimination capacity of a passive methane biofilter

Passive biofilters are used for controlling CH_4 emissions from different sources with the help of methanotrophic bacteria. The CH_4 elimination capacity of a biofilter can be affected by different factors, such as the structure and composition of the filter material and formation of bacterial exopolymeric saccharides (EPS). Recognising these factors and resolving their effect on the elimination capacity is important for efficient greenhouse gas emission control. Hence, we studied the evolution of the elimination capacity of a passive CH_4 biofilter containing soil as low-cost filter material. We aimed at identifying the factors affecting the elimination capacity and tested the effectiveness of a mechanical regeneration method for improving the operation efficiency. A laboratory-scale biofilter containing landfill soil was operated for 148 days. The CH_4 removal efficiency reached 70 % in the beginning of the operation (0–7 days), but stabilised at 25 % after 50 days. The filter bed was mixed and loosened twice during the operation. As a result, the glucose content of the soil representing the clogging agent secreted by bacteria (EPS) remained stable throughout the experiment (23 mg g_{dw}^{-1}) and O_2 penetrated deeper in the filter bed indicating improved gas diffusion. However, the CH_4 removal efficiency did not increase from 25–30 %. The reason for this remained unknown, but the results indicated that soil as filter material was able to maintain its elimination capacity despite the formation of EPS. Mixing was shown to be an effective and necessary method for improving the gas diffusion properties of the filter bed.

General information

Publication status: Published
MoE publication type: D3 Professional conference proceedings
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Contributors: Maanoja, S., Rintala, J.
Number of pages: 6
Pages: 83-88
Publication date: 2015

Host publication information

Title of host publication: BioTechniques Ghent 2015 The 6th international conference on biotechniques for air pollution control : Conference Proceedings
Keywords: Methane, Biofiltration, Passive operation, Landfill soil

Bibliographical note

ISBN kysytty, HO.
Ei ole, HO.
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Professional

Fast pyrolysis of coal, peat, and torrefied wood: Mass loss study with a drop-tube reactor, particle geometry analysis, and kinetics modeling

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Urban circular bioeconomy (UrCirBio)
Contributors: Tolvanen, H., Kokko, L., Raiko, R.
Pages: 148-156
Publication date: 2013
Peer-reviewed: Yes

Publication information

Journal: Fuel
Volume: 111
Issue number: September
ISSN (Print): 0016-2361
Ratings:

Scopus rating (2013): CiteScore 5.7 SJR 1.762 SNIP 2.531
Original language: English
DOIs:

10.1016/j.fuel.2013.04.030

Bibliographical note

Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-06-29
Publisher name: Elsevier Ltd.

Source: researchoutputwizard
Source ID: 3549
Research output: Contribution to journal › Article › Scientific › peer-review

Fate of dissolved organic matter in softwood element-chlorine-free bleached kraft mill fiberline

General information
Publication status: Published
MoE publication type: G5 Doctoral dissertation (article)
Organisations: Department of Chemistry and Bioengineering
Contributors: Luonsi, A.
Publication date: 2010

Publication information
Place of publication: Tampere
Publisher: Tampere University of Technology
ISBN (Print): 978-952-15-2344-1
Original language: English

Publication series
Name: Tampereen teknillinen yliopisto. Julkaisu
Publisher: Tampere University of Technology
Volume: 878
ISSN (Print): 1459-2045

Bibliographical note
Awarding institution:Tampere University of Technology
Source: researchoutputwizard
Source ID: 8687
Research output: Book/Report › Doctoral thesis › Collection of Articles

Fate of trace elements during and after anaerobic digestion: a sequential extraction method and DGT technique to assess bio-accessible trace elements in digestate

Different chemical interactions between trace elements and organic/inorganic compounds originating from the substrate and generated during the anaerobic digestion process will determine the speciation of trace elements in anaerobic digesters. After anaerobic digestion, digestates are exposed to oxidizing conditions which may favor a change of trace elements' speciation and consequently bio-accessibility for soil microorganisms and plants when digestates are spread on lands as organic amendment. Several techniques were used to assess the mobility, accessibility, and potential bio-availability of
trace elements in digestates for environmental risk assessments of digestate utilization as a soil fertilizer. The aim of this thesis is to evaluate a sequential extraction procedure and the diffusive gradients in thin films technique (DGT) to assess bio-accessible trace elements in digestate samples. Samples were taken from full-scale anaerobic digestion plants treating a mixture of industrial and municipal solid wastes or sewage sludge. The elements investigated include Al, As, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, Pb, Sb, Se, Zn and W.

A sequential extraction procedure, originally conceived for organic matter fractionation, was implemented to simultaneously extract organic matter and trace elements in a substrate and digestate sample. It was observed that more than 60% of total As, Cd, Co, Fe, Mn, Ni and Zn were extracted along with the operationally defined organic matter fractions in both samples. In contrast, a lower recovery was observed for Al, Cr, Cu, Mo and Pb. These elements were mainly found in the dissolved organic matter fraction where soluble trace elements (e.g. free ions and complexed with organic/inorganic ligands) are
likely bio-accessible for microbial up-take. Moreover, a high portion of elements was found in the mineral fraction (e.g. sulfide), which was considered poorly bio-accessible. However, the feasibility of using the aforementioned method was questioned following the low efficiency of extraction of certain trace elements during the extraction procedure. Moreover, it was acknowledged that chemical reagents employed during the extraction procedure could have promoted a dissolution/precipitation of trace elements and therefore a change in their fractionation.

Therefore, DGT technique was tested to fractionate trace elements and it was observed that this technique increased the sensitivity of trace elements monitoring compared to conventional dissolved elements measurements in digested sewage sludge. However, it was observed that the DGT samplers' deployment time in digested sewage sludge should be carefully evaluated. Additionally, the digestate matrix lowered the accumulation of some trace elements in the DGT samplers. Therefore, DGT labile trace elements (i.e. most bio-accessible species) can be correctly estimated provided a careful adapta-
tion of the deployment time as well as an evaluation of the matrix effect is performed in digestate samples. Unless this, general trend of labile trace elements over time could be estimated such as the distribution of labile trace elements over time in digestate exposed to air. Therefore, the effect of atmospheric air on the mobility and bio-accessibility of trace

elements, including labile and soluble fractions, in digested sewage sludge was investigated. The exposure of digestate to air promoted dissolution of Al, As, Co, Cr, Cu, Fe, Mn, Mo and Pb, suggesting that a possible increase in their mobility may likely occur
during digestate storage in open tanks or handling before land spreading. Labile elements' fraction increased only during an increase of aeration (except for Fe and Mn), suggesting that their short-term bio-accessibility can increase only after significant aeration as the one assumed to occur when digestate land spreading takes place.

These results open new fields of investigation for improving estimation of bio-accessible trace elements in digestate samples. For example, DGT technique should be further explored to accurately estimate labile trace elements concentrations in digestates.

General information
Publication status: Published
MoE publication type: G5 Doctoral dissertation (article)
Organisations: Materials Science and Environmental Engineering
Contributors: Laera, A.
Publication date: 22 May 2019

Publication information
Publisher: Tampere University
Original language: English

Publication series
Name: Tampere University Dissertations
URLs:

http://urn.fi/URN:NBN:fi:tuni-201906182085. Embargo ended: 22/05/20
Research output: Book/Report › Doctoral thesis › Collection of Articles

Feasibility of Flexible Biomass Utilization in Energy Systems
Globally the fastest growing renewable energy production methods are weather
dependent solar and wind power production. However, their locality and fluctuating nature may make the energy demand and production unbalanced and thus increases the need for system flexibility.
Biomass is available in one form or another almost everywhere on Earth. It has
been recognized to have potential for providing flexibility into energy systems. Even though technological possibilities for biomass utilization are numerous, detailed costs of the flexibility means are often ignored. This thesis looks in detail into the feasibility of flexible biomass utilization methods through practical examples; biomass to chemicals, biomass to heat and power and biomass as a transport fuel.
The results of this study provides suggestions how to increase the feasibility of
biomass utilization in energy system levels. The results showed that biomass can
provide flexibility through demand response, flexible production, and useful power storage. These can be achieved with currently existing technologies that can be adopted in a short timescale through introducing subsidies.. It was also shown that the feasibility of biomass utilization method can be improved through side-product, optimized running mode, or technical improvements. The most efficient way to increase the feasibility was operational optimization. The key factors in the feasibility of biomass utilization methods are investment and fuel costs. However, as sustainable amount of biomass is limited other flexibility means will be needed.
Future studies should include accurate forecasting on cost and price
development, since these are often based on assumptions. In addition, sustainability and carbon emissions of the whole biomass production chain should be studied.

General information
Publication status: Published
MoE publication type: G5 Doctoral dissertation (article)
Organisations: Research group: Bio- and Circular Economy, Materials Science and Environmental Engineering
Contributors: Pääkkönen, A.
Number of pages: 80
Publication date: 13 Dec 2019

Publication information
Publisher: Tampere University
ISBN (Print): 978-952-03-1334-0
ISBN (Electronic): 978-952-03-1335-7
Original language: English

Publication series
Name: Tampere University Dissertations
Volume: 166

ISSN (Print): 2489-9860
ISSN (Electronic): 2490-0028
URLs:
http://urn.fi/URN:ISBN:978-952-03-1335-7
Research output: Book/Report › Doctoral thesis › Collection of Articles

Fermentative metabolism of an anaerobic, thermophilic consortium on plant polymers and commercial paper samples

The purpose of the study was to examine the feasibility and capacity of a thermophilic microbial consortium to produce fermentative metabolites from plant polymers. The consortium comprised of cellulolytic anaerobes that were originally enriched from a compost pile using cellulose as the substrate. Fermentative metabolism was examined with monosaccharides, disaccharides, hemicellulose, starch, pectin, chitin, and eight commercial paper samples without further enrichment of the culture to each specific substrate. In general, H_2, CH_4, CO_2, and organic acids were the main metabolites on all substrates but the metabolite profiles varied with the substrate. Similar H_2 yields of 2-3molmol^{-1} substrate at 48h were obtained with all monosaccharides and disaccharides. The CO_2 yields were higher with disaccharides than with monosaccharides, 4.5 vs 2molmol^{-1} substrate. Metabolite yields were relatively low with glyceraldehyde, glycerol, and arabinose. Paper samples containing high amounts of chemical pulp produced the highest metabolite yields, and biodegradation accounted for ≤74% of total dry weight loss. The fermentative metabolism of the paper samples varied with the pulp composition and the amount of inorganic material. Bacterial community analysis using pyrosequencing analysis of 16S rRNA gene showed a predominance of members of the order Clostridiales, including members of genera Clostridium and Lutispora, which contain known cellulolytic organisms. Most differences among the samples were attributed to small taxonomic groups represented by ≤10% of total sequences.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Department of Animal Science, Ohio State University
Contributors: Carver, S. M., Nelson, M. C., Yu, Z., Tuovinen, O. H.
Number of pages: 12
Pages: 11-22
Publication date: 1 Apr 2015
Peer-reviewed: Yes

Publication information

Journal: Biomass & Bioenergy
Volume: 75
ISSN (Print): 0961-9534
Ratings:
Scopus rating (2015): CiteScore 6.8 SJR 1.51 SNIP 1.587
Original language: English
ASJC Scopus subject areas: Agronomy and Crop Science, Forestry, Renewable Energy, Sustainability and the Environment, Waste Management and Disposal
Keywords: Anaerobic biodegradation, Biohydrogen, Cellulose biodegradation, Fermentation, Plant polymers
DOIs:
10.1016/j.biombioe.2015.02.005
URLs:
http://www.scopus.com/inward/record.url?scp=84923621284&partnerID=8YFLogxK (Link to publication in Scopus)
Source: Scopus
Source ID: 84923621284
Research output: Contribution to journal › Article › Scientific › peer-review

Fe_2O_3-TiO_2 Nano-heterostructure Photoanodes for Highly Efficient Solar Water Oxidation

Harnessing solar energy for the production of clean hydrogen by photo-electrochemical water splitting represents a very attractive, but challenging approach for sustainable energy generation. In this regard, the fabrication of Fe_2O_3-TiO_2 photoanodes is reported, showing attractive performances [≈2.0 mA cm^{-2} at 1.23 V vs. the reversible hydrogen electrode in 1 M NaOH] under simulated one-sun illumination. This goal, corresponding to a tenfold photoactivity enhancement with respect to bare Fe_2O_3, is achieved by atomic layer deposition of TiO_2 over hematite (α-Fe_2O_3) nanostructures fabricated by plasma enhanced-chemical vapor deposition and final annealing at 650 °C. The adopted approach enables an intimate Fe_2O_3-TiO_2 coupling, resulting in an electronic interplay at the Fe_2O_3/TiO_2 interface. The reasons for the photocurrent enhancement determined by TiO_2 overlayers with increasing thickness are unraveled by a detailed chemico-physical investigation, as well as by the study of photo-generated charge carrier dynamics. Transient absorption spectroscopy shows that the increased photoelectrochemical response of heterostructured photoanodes compared to bare hematite is due to an enhanced separation of photogenerated charge carriers and more favorable hole dynamics for water oxidation. The stable responses obtained even in simulated seawater provides a feasible route in view of the eventual large-scale generation of renewable energy.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Tampere University of Technology, Research group: Supramolecular photochemistry, Universita degli Studi di Padova, Italy, Universiteit Antwerpen, Universitat zu Koln, Universita degli Studi di Brescia
Contributors: Barreca, D., Carraro, G., Gasparotto, A., Maccato, C., Warwick, M. E. A., Kaunisto, K., Sada, C., Turner, S., Gönüllü, Y., Ruoko, T., Borgese, L., Bontempi, E., Van Tendeloo, G., Lemmetyinen, H., Mathur, S.
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Advanced Materials Interfaces
Volume: 2
Issue number: 17
ISSN (Print): 2196-7350
Ratings:

Scopus rating (2015): CiteScore 2.2 SJR 1.193 SNIP 0.738
Original language: English
ASJC Scopus subject areas: Mechanical Engineering, Mechanics of Materials
Keywords: FeO, Nano-heterostructures, Photoelectrochemistry, TiO, Water splitting
Electronic versions:

Fe2O3-TiO2_post-print
DOIs:

10.1002/admi.201500313
URLs:

http://urn.fi/URN:NBN:fi:tty-201612024841
Source: Scopus
Source ID: 84955180397
Research output: Contribution to journal › Article › Scientific › peer-review

Finland's Water Services: Looking to its Past to Figure Out its Future.

General information
Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Civil Engineering
Contributors: Katko, T. S.
Publication date: Mar 2018
Peer-reviewed: No

Publication information
Journal: Water and Wastewater International
ISSN (Print): 0891-5385
Ratings:

Scopus rating (2018): SJR 0.106
Original language: English
URLs:

http://www.waterworld.com/articles/wwi/print/volume-33/issue-1/technology-case- studies/finland-s-water-services.html
Research output: Contribution to journal › Article › Scientific

Finnish engineering education for the benefit of people and environment

General information
Publication status: Published
MoE publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Chemistry and Bioengineering
Contributors: Takala, A., Korhonen-Yrjänheikki, K.
Number of pages: 10
Pages: 1-10
Publication date: 2010

Host publication information
Title of host publication: International Conference Engineering Education in Sustainable Development, EESD´10, 19-22 September 2010, Gothenburg, Sweden

Bibliographical note
Konferenssiartikkeli CD:llä
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 9361
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific

Finnish water services: Experiences in global perspective

General information
Publication status: Published
MoE publication type: C1 Separate scientific books
Organisations: Department of Civil Engineering
Contributors: Katko, T. S.
Number of pages: 288
Publication date: 4 Nov 2016

Publication information
Place of publication: Helsinki
Publisher: Finnish Water Utilities Association
ISBN (Print): 978-952-6697-26-0
Original language: English
Keywords: Water services, History, Development, Leadership, Institutions, Governance
URLs:

http://www.finnishwaterservices.fi (intoductory pages, ordering instructions)

http://www.vvy.fi/shop (ordering)
Research output: Book/Report › Book › Scientific › peer-review

Finnish water services: Experiences in global perspective

General information
Publication status: Published
MoE publication type: C1 Separate scientific books
Organisations: Civil Engineering
Contributors: Katko, T. S.
Number of pages: 288
Publication date: 7 Jul 2017

Publication information
Place of publication: London
Publisher: IWA Publishing
ISBN (Electronic): 9781780408743
Original language: English
Keywords: Water services, History, Development, Leadership, Institutions, Governance
Additional files:

Finnish Water Services_eBook_IWA

Bibliographical note
https://www.iwapublishing.com/books/finnish-water-services-experiences-global-perspective
Research output: Book/Report › Book › Scientific › peer-review

Fire, Thirst, Health and Hygiene: Root Causes for the Introduction of Water Supply and Sanitation in Kajaani

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, University of Tampere
Contributors: Juuti, P., Rajala, R., Katko, T. S.
Pages: 275-286
Publication date: 2009

Host publication information
Title of host publication: Elämän virta : Kajaanin veden historia
Publisher: TamPub
Editors: Juuti, P., Rajala, R., Katko, T.

ISBN (Print): 978-951-800-320-8
ISBN (Electronic): 978-951-44-7657-0
URLs:
http://urn.fi/urn:isbn:978-951-44-7657-0
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Flotaatiokennon injektorin diffuusori

General information
Publication status: Published
MoE publication type: H1 Granted patent
Organisations: Department of Energy and Process Engineering
Contributors: Nieminen, E., Virtanen, J.
Publication date: 2008

Publication information
Patent number: WO 2007/042619 A1
Priority date: 31/12/08
Priority number: FI 119554 B
Original language: English

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 13125
Research output: Patent › Scientific

Fluidized bed bioreactor for multiple environmental engineering solutions
Fluidized bed bioreactors (FBR) are characterized by two-phase mixture of fluid and solid, in which the bed of solid particles is fluidized by means of downward or upward recirculation stream. FBRs are widely used for multiple environmental engineering solutions, such as wastewater treatment, as well as some industrial applications. FBR offers many benefits such as compact bioreactor size due to short hydraulic retention time, long biomass retention on the carrier, high conversion rates due to fully mixed conditions and consequently high mass transfer rates, no channelling of flow, dilution of influent concentrations due to recycle flow, suitability for enrichment of microbes with low Km values. The disadvantages of FBRs include bioreactor size limitations due to the height-to-diameter ratio, high-energy requirements due to high recycle ratios, and long start-up period for biofilm formation. This paper critically reviews some of the key studies on biomass enrichment via immobilisation of low growth yield microorganisms, high-rates via fully mixed conditions, technical developments in FBRs and ways of overcoming toxic effects via solution recycling. This technology has many potential new uses as well as hydrodynamic characteristics, which enable high-rate environmental engineering and industrial applications.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Materials Science and Environmental Engineering, Research group: Bio- and Circular Economy, Yildiz Technical University, Istanbul Medeniyet University, CSIRO Land and Water
Contributors: Özkaya, B., Kaksonen, A. H., Sahinkaya, E., Puhakka, J. A.
Pages: 452 - 465
Publication date: 1 Mar 2019
Peer-reviewed: Yes

Publication information
Journal: Water Research
Volume: 150
ISSN (Print): 0043-1354
Ratings:
Scopus rating (2019): CiteScore 14.5 SJR 2.932 SNIP 2.542
Original language: English
Keywords: Biofilm, Fluidized bed bioreactor, High rate, Water treatment, Wastewater treatment
DOIs:
10.1016/j.watres.2018.11.061

Bibliographical note
EXT="Kaksonen, Anna H."
EXT="Sahinkaya, Erkan"

Source: Bibtex
Source ID: OZKAYA2019452
Research output: Contribution to journal › Article › Scientific › peer-review

Fluidized-bed denitrification of mining water tolerates high nickel concentrations

This study revealed that fluidized-bed denitrifying cultures tolerated soluble Ni concentrations up to 500mg/L at 7-8 and 22°C. From 10 to 40mg/L of feed Ni, denitrification resulted in complete nitrate and nitrite removal. The concomitant reduction of 30mg/L of sulfate produced 10mg/L of sulfide that precipitated nickel, resulting in soluble effluent Ni below 22mg/L. At this stage, Dechloromonas species were the dominant denitrifying bacteria. From 60 to 500mg/L of feed Ni, nickel remained in solution due to the inhibition of sulfate reduction. At soluble 60mg/L of Ni, denitrification was partially inhibited prior to recover after 34days of enrichment by other Ni-tolerant species (including Delftia, Zoogloea and Azospira) that supported Dechloromonas. Subsequently, the FBR cultures completely removed nitrate even at 500mg/L of Ni. Visual Minteq speciation model predicted the formation of NiS, $NiCO_3$ and $Ni_3(PO_4)_2$, whilst only $Ni_3(PO_4)_2$ was detected by XRD.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Urban circular bioeconomy (UrCirBio), Université Paris-Est, Laboratoire Géomatériaux et Environnement (EA 4508), UPEM
Contributors: Zou, G., Papirio, S., van Hullebusch, E. D., Puhakka, J. A.
Number of pages: 7
Pages: 284-290
Publication date: 1 Mar 2015
Peer-reviewed: Yes

Publication information

Journal: Bioresource Technology
Volume: 179
ISSN (Print): 0960-8524
Ratings:

Scopus rating (2015): CiteScore 9.2 SJR 2.243 SNIP 1.899
Original language: English
ASJC Scopus subject areas: Bioengineering, Environmental Engineering, Waste Management and Disposal
Keywords: Denitrification, Denitrifying communities, Fluidized-bed reactor, Nickel, X-ray diffraction
DOIs:

10.1016/j.biortech.2014.12.044
URLs:

http://www.scopus.com/inward/record.url?scp=84919934975&partnerID=8YFLogxK (Link to publication in Scopus)
Source: Scopus
Source ID: 84919934975
Research output: Contribution to journal › Article › Scientific › peer-review

Focus and Change of Water Management in Finland – Analysis of Vesitalous Journal, 1960-2009

General information

Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Department of Chemistry and Bioengineering, Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Contributors: Jaatinen, T. T. O., Katko, T. S., Pynnönen, S. T., Vihanta, J. S.
Pages: 10-32
Publication date: 14 Sep 2012
Peer-reviewed: Unknown

Publication information

Journal: Ympäristöhistoria: Finnish Journal of Environmental History
Issue number: 3
ISSN (Print): 1799-6953
Original language: English
URLs:

http://www.uta.fi/yky/tutkimus/historia/projektit/iehg/Ymparistohistoria/No32012/YFJEH%2003%202013%20webo.pdf

Research output: Contribution to journal › Article › Professional

Foreword Towards More Resilient Water Services

General information
Publication status: Published
MoE publication type: B2 Part of a book or another research book
Organisations: Civil Engineering, Research group: Capacity Development of Water and Environmental Services CADWES
Contributors: Katko, T. S.
Number of pages: 5
Pages: 9-13
Publication date: Sep 2019

Host publication information
Title of host publication: Resilient water services and systems: the foundation of well-being
Publisher: IWA Publishing
Editors: Juuti, P., Mattila, H., Rajala, R., Schwartz, K., Staddon, C.
ISBN (Print): 9781780409764
ISBN (Electronic): 9781780409771
DOIs:

10.2166/9781780409771
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific

Forgotten infrastructure - In the quest for development, sustainability and security

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Chemistry and Bioengineering
Contributors: Hukka, J., Katko, T. S., Pietilä, P. E., Seppälä, O., Vinnari, E. M.
Pages: 318-325
Publication date: 2010

Host publication information
Title of host publication: Proceedings of the Conference on Security in Futures - Security in Change, 3-4 June 2010, Turku, Finland. FFRC eBook
Editors: Auffermann, B., Kaskinen, J.

Bibliographical note
poistettu tupla r=3725
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 8108
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

FSES 2013, Finnish Conference of Environmental Sciences, 2-3 May 2013, Tampere, Finland. Proceedings

General information
Publication status: Published
MoE publication type: C2 Edited books
Organisations: Department of Chemistry and Bioengineering
Contributors: Pynnönen, S. (ed.), Tuhkanen, T. (ed.)
Number of pages: 156
Publication date: 2013

Publication information
Place of publication: Tampere
Publisher: Tampere University of Technology
ISBN (Print): 978-952-15-3049-4
Original language: English

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-07-29
Source: researchoutputwizard
Source ID: 3202

Research output: Book/Report › Anthology › Scientific › peer-review

Full scale landfill bottom liner test structures at Ämmässuo landfill, Espoo, Finland

Full scale test structures were constructed in sumemr 1996 to the Ämmässuo landfill to gather experience on quality control during the constructionand long term behviour of mineral liner and combination liners. Actual leachate was used to create the chemical loading and a hydraulic pressure of one meter. The leachate was implemented in October 1996, and the structures were monitored for two years. The structures were continously monitored by temperature and soil moisture sensors installed into the liner. The leachate seeping through the line structure was colledted to the lysimeter basins and further to the lusimeter wells, in which the amount of the water was measured automatically by pressure sensors. In addition, frost penetration and infiltrometer measurements were performed and samples were taken for laboratory tests during the two-year period. The structures were pulled down under control in November 1998.

General information

Publication status: Published
MoE publication type: B3 Non-refereed article in conference proceedings
Organisations: SCC Viatek Ltd.
Contributors: Leppänen, M., Kaartokallio, A., Loukola, E.
Number of pages: 8
Pages: 173-180
Publication date: Oct 1999

Host publication information

Title of host publication: Sardinia 99, Seventh International Waste Management and Landfill Symposium, 4-8 October, S. Margherita di Pula, Cagliari, Sardinia, Italy. Proceedings, Vol. I-V.
Volume: III
Editors: Christensen, T. H., Cossu, R., Stegmann, R.
Keywords: Landfill
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific

Fungal treatment of landfill mining fine fraction to increase its stability and end-use potential

Landfill mining, i.e. extraction, processing, treatment and recovery of landfilled materials, is conducted to prevent pollution and to recover materials and energy from waste (Krook et al., 2012). On average, half of landfilled waste is material resembling soil, i.e. its fine fraction (FF, < 20 mm) (Kaartinen et al., 2013). The end-use potential of the FF is limited due to its organic matter content, a possible presence of harmful contaminants as well as its stability. The aim of this study was to evaluate if fungal treatment stabilises FF and removes organic contaminants thus allowing an end-use of FF as soil-like material. Basidiomycetous fungi were obtained and maintained according to Valentin et al. (2008) prior to experiments and were screened for their potential to grow in FF originally landfilled between 1967 – 1989. Screening experiments and previous experiences with contaminated soil (Valentin et al. 2008) led to the selection of Phanerochaete velutina for fungal treatment experiments, which were carried out at room temperature for 58 days. Two acryl columns (height 600 mm, radius 75 mm) were filled with 1 – 2 cm layer of gravel at the bottom and 5.8 kg of FF on the top as well as 500 mL of tap water. The fungal column was amended with fungal bark inoculum to the middle of the column. Two ports at the bottom of the columns were used to collect leachate and aerate columns with humidified air at 0.1 L/min, respectively. Carbon dioxide (CO_2) production was followed during the experiment with gas chromatography. The columns were covered with aluminium foil to stop germination of seeds present in FF. Total solids and volatile solids (VS) were analysed from FF according to standard SFS 3008. Organic contaminants mentioned in criteria for landfilling were analysed from FF in an accredited laboratory. Aerobic stability of FF was determined by the Oxitop method and anaerobic stability of FF was determined as biochemical methane potential. In less than one month, fungal mycelium was observed throughout the FF in the column inoculated with Phanerochaete velutina while no mycelium was observed in the control column. At this stage the experiment was continued in order to allow fungal mycelium to degrade and produce CO_2. Concentrations of mineral oils (C10-C40) and organic matter, measured as VS, were higher in FF than in waste that can be placed to landfills. Mineral oil concentrations exceeded Finnish criteria set for contaminated soil. The aerobic stability of FF was high even initially and it did not increase in control or fungal treatments. Fungal treatment reduced organic matter content of FF and reduced mineral oil concentrations, although the criteria set in legislation could not be met in these experiments.

General information

Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Research group: Industrial Bioengineering and Applied Organic Chemistry, Department of Chemistry and Bioengineering, University of Helsinki, Department of Food and Environmental Sciences
Contributors: Palmroth, M. R. T., Mönkäre, T. J., Steffen, K. T.
Pages: 47
Publication date: 2015

Host publication information

Title of host publication: Book of abstracts of the 6th European Bioremediation Conference

Editors: Kalogerakis, N., Fava, F., Manousaki, E.
Article number: 169
ISBN (Print): 978-960-8475-23-6
ASJC Scopus subject areas: Bioengineering, Geotechnical Engineering and Engineering Geology, Environmental Engineering
Keywords: bioremediation

Bibliographical note
xabstract
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Gender comparison - The university students' exam results in the environmental and energy area

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Pitkänen, A., Raiko, R., Korpinen, L.
Pages: 3299-3308
Publication date: 2012

Host publication information
Title of host publication: INTED 2012 Proceedings, 6th International Technology, Education and Development Conference, March 5th-7th, 2012, Valencia, Spain
Place of publication: Spain
Publisher: International Association of Technology, Education and Development IATED
Editors: Gomez Chova, L., Lopez Martinez, A., Candel Torres, I.
ISBN (Print): 978-84-615-5563-5

Publication series
Name: International Technology, Education and Development Conference
URLs:
http://www.iated.org

Bibliographical note
INTED2012 abstracts cd isbn 978-84-615-5562-8; INTED2012 proceedings cd isbn: 978-84-615-5563-5.Ei UT-numeroa 28.8.2013
Contribution: organisation=epr,FACT1=1
Publisher name: International Association of Technology, Education and Development IATED
Source: researchoutputwizard
Source ID: 5074
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Genesis of Water supply and sanitation services in Finland

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Civil Engineering, Research group: Capacity Development of Water and Environmental Services CADWES
Contributors: Rajala, R. P., Juuti, P. S., Katko, T. S.
Number of pages: 11
Pages: 18-28
Publication date: Apr 2019
Peer-reviewed: Yes

Publication information
Journal: Ympäristöhistoria: Finnish Journal of Environmental History
Volume: 8
Issue number: 1
ISSN (Print): 1799-6953
Original language: Finnish
Electronic versions:
YFJEH-1_2019_low Copy
URLs:
http://www.cadwes.com/wp-content/uploads/2019/04/YFJEH-1_2019_low.pdf

Research output: Contribution to journal › Article › Scientific › peer-review

Geometry of plate fins for maximizing heat transfer

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Mechanics and Design, Department of Energy and Process Engineering
Contributors: Karvinen, R., Karvinen, T.
Number of pages: 10
Pages: 1-10
Publication date: 2010

Host publication information
Title of host publication: 14th International Heat Transfer Conference IHTC-14, August 8-13, 2010, Washington DC, USA
Publisher: ASME

Bibliographical note
50 % Mec, 50 % Epr, poistettu tupla r=3301
Contribution: organisation=epr,FACT1=0.5
Contribution: organisation=mec,FACT2=0.5
Source: researchoutputwizard
Source ID: 8302
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Geo + Ympäristö = Ympäristögeotekniikka?

General information
Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Department of Civil Engineering, Research group: Earth Constructions
Contributors: Leppänen, M.
Number of pages: 2
Pages: 6-7
Publication date: Mar 2013
Peer-reviewed: Unknown

Publication information
Journal: Geofoor
Issue number: 39
Original language: Finnish
URLs:
http://www.getunderground.fi/getfile.ashx?cid=221157&cc=3&refid=52
Research output: Contribution to journal › Article › Professional

Gestao e organizacao dos servicos de saneamento : Abordagens europeias.

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering
Contributors: Seppälä, O., Katko, T. S.
Pages: 135-155
Publication date: 2013

Host publication information
Title of host publication: Politica publica e gestao de servicos de saneamento
Place of publication: Belo Horizonte; Rio de Janeiro
Publisher: Editora da Universidade Federal de Minas Gerais (UFMG); Editora Fiocruz
Editors: Heller, L., Esteban Castro, J.
ISBN (Print): 978-85-7041-953-8

Bibliographical note
Política Pública e Gestão de Serviços de Saneamento (Public Policy and Management of Water and Sanitation Services)
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-11-29

Source: researchoutputwizard
Source ID: 3400
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Glazed spaces: A simplified calculation method for the evaluation of energy savings and interior temperatures

Previous studies have shown that temperatures inside glazed balconies are almost without exception higher than those of outside air. This is due to the space's ability to capture and store the building's heat losses and solar radiation. The interior temperatures and energy saving effects of glazed balconies are, however, not particularly good in Finland, because the implemented solutions are not optimized for these issues. The purpose of this study is to introduce simplified evaluation methods for the energy saving and interior air temperature evaluation of glazed spaces and to verify the method reliably with the help of measured and simulated values of typical Finnish 1970s apartment blocks. The presented method can be used for optimizing and showing the energy saving impact as well as the mean, maximum and minimum temperatures of different type of glazed spaces in the preliminary design stage. The results show that the accuracy of the method is sufficient for designing if nine parameters are changed at most. The accuracy is affected by the number of changes made in relation to the typical 1970s apartment blocks in Finland, which was chosen as a starting point for the method's development.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Research group: Service Life Engineering of Structures, School of Architecture, Research group: Built Environment in Transition, Research group: Built Environment in Transition, A-Insinöörit Suunnittelu Oy
Contributors: Hilliaho, K., Kovalainen, V., Huuhka, S., Lahdensivu, J.
Number of pages: 18
Pages: 27-44
Publication date: 1 Aug 2016
Peer-reviewed: Yes
Early online date: 30 Apr 2016

Publication information

Journal: Energy and Buildings
Volume: 125
ISSN (Print): 0378-7788
Ratings:

Scopus rating (2016): CiteScore 6.6 SJR 2.055 SNIP 1.969
Original language: English
Keywords: Glazed space, Balcony glazing, Interior temperature, Energy saving effect, Simplified calculation, Ida-ice, THERMAL SIMULATION, ATTACHED SUNSPACES, VALIDATION, MODEL
DOIs:

10.1016/j.enbuild.2016.04.063
Source: WOS
Source ID: 000378962300004
Research output: Contribution to journal › Article › Scientific › peer-review

Global challenges and role of institutions in water services

General information

Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Civil Engineering
Contributors: Katko, T. S.
Number of pages: 1
Pages: 15
Publication date: 9 May 2017
Peer-reviewed: Unknown

Publication information

Journal: Econetin asakaslehti AQ
Issue number: 1
ISSN (Print): 1799-7763
Original language: English
URLs:

http://digimag.econetgroup.fi/digimag/117-english/aqen0117_01-xml

http://www.econetgroup.fi/en/news/2017/05/09/global-challenges-and-role-of-institutions-in-water-services (News. 09.05.2017.)
Research output: Contribution to journal › Article › Professional

Governance in water sector - comparing development in Kenya, Nepal, South Africa and Finland

General information
Publication status: Published
MoE publication type: C2 Edited books
Organisations: Bio- ja ympäristötekniikka, Department of Civil Engineering, Former organisation of the author
Contributors: Juuti, P. (ed.), Katko, T. (ed.), Mäki, H. (ed.), Nyanchaga, E. (ed.), Rautanen, S. (ed.), Vuorinen, H. (ed.)
Publication date: 2007

Publication information
Publisher: Unknown Publisher
ISBN (Print): 978-951-44-6950-3
Original language: English
Electronic versions:
juuti_governance_in_water_sector.pdf
URLs:
http://urn.fi/URN:NBN:fi:tty-2011061614705

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14488
Research output: Book/Report › Anthology › Scientific › peer-review

Groundwater as a source of conflict and cooperation: Towards creating mutual gains in a finnish water supply project
Community planners, decision-makers and authorities frequently encounter conflicts revolving around natural resource management as well as around urban planning. Since the 1970s, the dynamics of conflict resolution have evolved from conventional expert-based rational solutions towards collaborative ones. Against this background, our research investigates one contentious groundwater project in the Tampere Region in Finland. Conflict assessment clarified the divergent interests of the multiple parties. Drawing on negotiation theory, this study illustrates how polarised positions and competitive framing, as well as the influence of historical baggage, may form an insurmountable barrier to successful negotiation. While the acknowledgement of various interests should form the heart of the integrative negotiation process, excessive energy is used for argumentation to protect predefined goals with as minor concessions as possible. Addressing the collaborative approach, we suggest multiple ways towards creating mutual gains and cooperation in future water supply projects.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Life Cycle Effectiveness of the Built Environment (LCE@BE)
Contributors: Kurki, V., Katko, T. S.
Number of pages: 15
Pages: 337-351
Publication date: 2015
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Halogen-Bond-Assisted Photoluminescence Modulation in Carbazole-Based Emitter

Halogen bonding between a carbazole-based, pyridine-substituted organic semiconductor and a common halogen-bond donor (pentafluoroiodobenzene) yields efficient halogen-bond-driven fluorescence modulation in solution. Steady-state, time-resolved emission and absorption spectroscopy as well as density functional theory studies demonstrate that the fluorescence modulation arises from halogen-bond-induced intramolecular charge transfer. Fluorescence modulation offers a range of possibilities both in solution and in the solid state, for instance providing a potential pathway for the design of tunable luminescent materials for light-emitting devices.

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Contributors: Salunke, J., Durandin, N., Ruoko, T., Rafael Candeias, N., Vivo, P., Vuorimaa-Laukkanen, E., Laaksonen, T. , Priimägi, A.
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Halpaa eli hyvää - minkälaisia merkityksiä vesihuoltoala rakentaa itsestään

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Contributors: Heino, O., Takala, A.
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Hanaa! Suomen vesihuolto - kehitys ja yhteiskunnallinen merkitys

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MoE publication type: C1 Separate scientific books
Organisations: Department of Chemistry and Bioengineering
Contributors: Katko, T. S.
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Contributors: Juuti, P., Katko, T.
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Heap Bioleaching of Low-grade Multimetal Sulphidic Ore in Boreal Conditions
The bioleaching of metal sulphide ore has developed into an important industrial process to recover valuable base metals from low-grade ores, because high grade ore resources are depleting. The Talvivaara deposits in Finland have been known for decades, but have not been utilized until now, because of the low nickel concentration. The aim of this work was to study the bioleaching process of a Finnish complex multimetal black schist ore in boreal conditions. The effects of pH and leaching temperature on the dissolution of valuable metals and gangue minerals were studied. The effect of low temperature on iron oxidation and mineral bioleaching was investigated. Microbial community development at different pH values and temperatures was tested in laboratory-scale bioleaching columns and finally the community dynamics were studied in a demonstration-scale bioheap over a period of three years in Talvivaara Finland.

The experiments were carried out using laboratory-scale columns containing about 9 kg of agglomerated ore. The columns were loaded with the ore, irrigated with pregnant leaching solution (PLS) by recycling and aerated from the bottom. The tested pH range was from 1.5 to 3.0 at 21 ºC and temperature range was from 7 to 50 ºC at pH 2.5. The particle size (d80) of the ore was 7.6 mm. Surface water taken from lake near the Sotkamo deposit (slightly affected by acid mine drainage) supplemented with nutrients was used for irrigation. Aeration was provided through a diffuser inserted at the base of the column. The iron- and sulphur-oxidizing bacterial culture used in inoculation of the columns, was enriched from surface water samples (pH 4.5-6.9) obtained from the ore deposit. The pH of irrigation solution was

maintained with continuous titration with H2SO4. The ore was acid consuming in all tested conditions. The actual pH of the irrigation solutions after 140 days were 0.1-0.5 units over the target values in all columns. Leaching at low pH resulted in increased acid consumption of 160 and 38 H2SO4 g kg-1 ore at pH 1.5 and 2.0 after 140 days. Temperature, at pH 2.5, had also effect on acid consumption. At 50 ºC acid consumption was highest and lowest at 21 ºC, being 29 and 8 H2SO4 g kg-1 ore, respectively.

The pH of the irrigation solution clearly affected to the dissolution of nickel and zinc. Nickel solubilization rate was 3.3 times higher at pH 1.5 than at pH 3.0, being 0.42 and 0.13 % (Ni) d-1, respectively. At pH 1.5 valuable metals yields were 59 % for Ni, 52 % for Zn, 13 % for Cu and 16 % for Co, whereas at pH 3.0 yields were 15 % for Ni, 10 % for Zn, 0.5 % for Cu and 6 % for Co after 140 days of bioleaching. No significant bioleaching happened after that at pH 1.5, 2.5 or 3.0. At pH 2.0 the maximum yields were achieved after 230 days of bioleaching. Nickel and zinc leaching rates and yields decreased nearly linearly as pH increased. Copper did not bioleach at high pH (2.5-3.0). After the beginning, no further cobolt dissolution happened at pH 3.0. Decrease in leaching rates may be due to a lack of dissolved ferric iron, serving as a leaching agent, or metal dissolution barriers created by precipitates on the ore surfaces. The ferric iron concentration in PLS increased all the time at pH 1.5, being 36 g l-1 after 140 days. At pH 2.0 the ferric iron concentrations varied, being highest 3.8 g l-1 after 97 days. At 2.5 and 3.0 no ferric iron was present in PLS and iron concentration remained low, being 15 mg l-1.

After 60 days of bioleaching the leach liquor at pH 1.5 became jelly-like due to solubilization of Si from the ore, which contained 42 % (w w-1) of SiO2. Quartz, phlogopite, and feldspars (anorthite and microcline) were the main Si-containing phases. After 110 days the Si concentration reached 2.96 g L-1 at pH 1.5. Soluble Si increases the solution viscosity and thus hinders leach liquor percolation trough the heap, lowers the oxygen transfer rate, and complicates subsequent metal extraction. Although, dissolved Si did not affect the solubilization of valuable metals, the pH value of the PLS must be kept at over 1.5 to slow down Si-containing mineral dissolution. At pH 2.5 less than 200 mg L-1 Si was solubilized and different temperatures had no effect on Si dissolution at that pH.

Based on an optimisation between the maximum valuable metal yields, leaching rates, the acid consumption, and the low dissolution of cations (Si, Al, Ca, Mg and Mn), the leaching solution pH of 2.0 was recommended for a bioheap application. At pH 2.0, the maximum leaching yields were achieved after 230 days, being 54 % for Ni, 37 % for Zn, 13 % for Cu and 12 % for Co.

Temperature strongly affected the valuable metal yields at pH 2.5. Leaching at low temperature (7 ºC) resulted in yields of 24 % for Ni, 17 % for Zn, 2 % for Cu and 6 % for Co after 496 days. The Cu leaching increased all the time during the experiment at 7 ºC, while at other temperatures it slowed down after 100 days. The highest yields were obtained at 21 ºC (26 % for Ni, 18 % for Zn, 0.5 % for Cu and 6 % for Co) after 153 days. After re-inoculation (day 65) with a thermophilic Sulfolobus culture, leaching at 50 ºC accelerated but slowed down soon and resulted in 18 % for Ni, 11 for Zn, 0.3% for Cu and 2% for Co (after 140 days). In the column leaching study, after the maximum yields, longer leaching time did not result more metals in solutions.

The redox increased during the first two months at 7 ºC and reflected the start of ferrous iron oxidation and microbial activity. The concentration of ferric iron was around 400 mg L-1 after two months. After that ferric iron was present all the time at 7 ºC and this demonstrated that more ferric iron was available for the oxidation of the mineral sulphide than at other temperatures. The leach liquor redox potential stabilized to 500-600 mV (Ag0/AgCl reference) at 7 ºC after 40 days and at 21 ºC right after beginning, whereas at 35 ºC and at 50 ºC it varied between 300-500 mV. At 50 ºC, all dissolved iron was in ferrous form inspite the variation of redox. After 50 days Fe2+ and Fetot were both 350 mg L-1 indicating that iron oxidation and precipitation occurred at the same time. Brown precipitates accumulated to the surfaces of the agglomerated ore in columns from 7 ºC to 50 ºC. Additionally, bright yellow precipitates were formed indicating elemental sulphur or Na-jarosite accumulation at 7 ºC and 21 ºC.

After 50 days of bioleaching, at 7 ºC leach liquor total cell counts (108-109 cells mL-1) were significantly higher than at other temperatures (106-107 cells mL-1). Cell counts remained that high troughout the column study. At the end of the experiment, total cell counts in the leach residues were studied. At 7, 21, 35 and 50 ºC cell counts of the leach residues were 3.4· 108, 2.3· 108, 1.1· 107 and 8.7· 106 cells ore g-1, respectively. The pH did not affect at 21 ºC the numbers of microorganisms in the PLS and cell counts remained at 106-108 cell mL-1 throughout the study and the leach residues contained about 108 cells g ore-1.

The microbial community composition and dynamics was by investigated by DNA extraction PCR-DGGE-sequencing approach. The microbial community were not affected by pH. In contrast, temperature affected the microbial populations. After the first months, Acidithiobacillus ferrooxidans AP 310 (96-99% sequence similarity, accession DQ35518) was the only species detected at 7 ºC and was also present at other temperatures. After the data of this study was published (2007), two new Acidithiobacillus species were described, A. ferrivorans and A. ferridurans. Genetically these species are very near each other. The 16S rRNA gene sequences of the bands that corresponded 99% of A. ferrooxidans AP310 (DQ35518) were identified again in 2015 using the basic local alignment search tool (BLAST). The 16S rRNA gene sequences of A. ferrooxidans at temperatures of 7 and 21 ºC corresponded 99% as A. ferrivorans SS3 (CP002985). One of the 16S rRNA gene sequences of A. ferroxidans strains at 35 ºC corresponded 99% as A. ferridurans ATCC 3302 (NR_117036). At 50 ºC, no proper A. ferroxidans 16S rRNA gene sequences were gained with the used methods. The presence of A. ferroxidans at 50 ºC was concluded based on the fact that the DGGE band was in the same place as the

other A. ferrooxidans bands. The 16S rRNA gene sequences of Acidithiobacillus ferrooxidans strains in pH between 1.5 and 3.0, at 21 ºC, corresponded also 99% as A. ferrivorans SS3 (CP002985). In the light of increased knowledge, these species cannot be separated with the denaturing gradient from 40 to 70% that were used in the DGGE. A. ferrooxidans, A. ferrivorans and A. ferridurans are able to oxidize both iron and sulphur compounds.

Leptospirillum ferrooxidans DSM 2705 (98-100%, X86776) and Sulfobacillus thermotolerans KR-1 (99%, DQ124681) were mainly detected at 21 ºC and 35 ºC. Sb. thermotolerans was present at 50 ºC. L. ferriphilum D1 (99 %, DQ665909) appeared after 300 days of bioleaching and was present in every leach residue, except at 7 ºC and pH 3.0. L. ferrooxidans and L. ferriphilum are able to oxidize only iron. Sb. thermotolerans is able to oxidize both iron and sulphur compounds.

Archaeal species were analyzed two times from leach liquors and three species were detected. A species related to an uncultured archaeon clone ant b7 (99%, DQ303249), nearest known species Thermoplasma acidiphilum DSM1728 (91%, AL445067) was present in all of the leach liquors except at pH 1.5. Archaea related to Sulfolobus metallicus DSM 6482 (98%, SM16SRRN1) were present at pH values 2.5 and 3.0 and in all other temperatures, except at 7 ºC. Sulfolobus metallicus is able to oxidize both iron and sulphur compounds. Ferroplasma acidiphilum DR1 (98%, AY222042) that can oxidize only iron, was present at pH 2.5 and 2.0, and in all temperatures, expect at 35 ºC.

The mixed iron- and sulphur-oxidizing culture in the recirculation solution at 7 ºC was used in the experiments where Fe2+-oxidation rate and optimum temperature were determined over a temperature range of 2-40 ºC. Two temperature optima of 22.4 ºC and 32.4 ºC were observed. This indicated the presence of both psychrotolerant and/ or mesophilic microorganisms in the culture. This supports the suggestion that A. ferrooxidans was actually A. ferrivorans, or both species were present. The specific oxidation rates for the culture were similar, with 13.5·10-8 and 12.8·10-8 mg Fe2+ cell-1 h-1 for 22.4 ºC and 32.4 ºC, respectively.

The two demonstration-scale bioheaps (17 000 t) at the Talvivaara mine site were operated and monitored by Talvivaara Mining Company for 30 months. After the start-up of heap irrigation, oxidation of pyrrhotite and pyrite increased the heap temperature in central locations up to 90 ºC. In the second winter temperatures inside the heaps decreased being still 80 ºC at the hottest spots. Leach liquor temperatures varied between 60 ºC and 15 ºC over the whole operation period. The target pH of the PLS was 2.0. Inspite of continuous titration pH varied during the 10 months between 3.5 and 3.0 and after that between 3.0 and 2.5.

The bacterial community composition on the heaps was monitored over time from manholes and the leach liquor collection ponds. At the end of the primary bioleach phase (18 months) cell counts were around 106 cells mL-1. Large temperature gradients resulted in the simultaneous presence of mesophilic and thermophilic iron- and sulphur-oxidisers in the heap. In the beginning diversity was broad, but decreased with time. A. ferrooxidans/ ferrivorans SS3 (99%, CP002985) was the dominant bacterium and an unknown bacterium related to clone H70 (91%, DQ328625) was present. After six months of bioheap operation L. ferrooxidans DSM 2705 (98%, X86776) was observed for the first time and it was present thereafter in nearly all samples. Archaea were analysed during the primary leaching phase from leach liquors. Two novel archaea and one archaea related to Thermoplasma acidophilum strain 122-1B2 (91-93%, NR_028235) were detected.

Several ore samples were drilled from the primary bioheaps after one year of bioheap operation. A. ferrooxidans/ A. ferrivorans SS3 (99%, CP002985) was present in nearly all samples. The novel bacterium related to clone H70 (91%, DQ328625) and A. caldus related bacteria (95%, AY427958) was detected from the areas of wide temperature variation. Sb. thermosulfidooxidans strain YN22 (99%, DQ650351) was found from the high temperature zones of the heap. Ferrimicrobium acidiphilum T23 (99%, AF251436) was present in the areas where temperature varied between 20 and 35 ºC. After 18 months of demonstration-scale heap operation, the heaps were reclaimed and restacked to the secondary bioheap. At the secondary leaching phase the community remained steady. A. ferrooxidans/ ferrivorans SS3 (99%, CP002985) dominated and the novel bacterium related to a clone H70 (91%, DQ328625) and L. ferrooxidans DSM 2705 (98-100%, X86776) were present in the leach liquors of secondary phase bioheaps.

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Helsinki sai ensimmäisen puhdistamonsa 1910; Helsinki gained its first wastewater treatment plant 1910

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Highly compact TiO2 films by spray pyrolysis and application in perovskite solar cells

Transparent and pinhole free hole-blocking layers such as TiO2 grown at low temperatures and by scalable processes are necessary to reduce production costs and thus enabling commercialization of perovskite solar cells. Here, the authors compare the transport properties of TiO2 compact layers grown by spray pyrolysis from commonly used titanium diisopropoxide bisacetylacetonate ([Ti(OPri)2(acac)2]) precursor to films grown by spray pyrolysis of TiCl4. Spray pyrolysis

provides insights into the interdependence of precursor chemistry and electron transport properties of TiO2 films and their influence on the performance of the perovskite solar cells. X-ray diffraction and X-ray photoelectron spectroscopy data confirm the chemical and structural composition of the obtained films. Thin film deposition at lower temperature (150 °C) are conducted using TiCl4 to evaluate the influence of crystal growth and topography by scanning electron microscopy and atomic force microscopy as well as thickness (profilometry) and transmittance (UV/Vis spectroscopy) on the power conversion efficiency of perovskite solar cells. TiO2 compact layers grown from TiCl4 enhance the power conversion efficiency by acting as superior electron transfer medium and by reducing hysteresis behavior, when compared to films grown using titanium diisopropoxide bisacetylacetonate. UV/Vis spectroscopy and external quantum efficiency studies reveal the correlation of transmittance on the power conversion efficiency.

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Contributors: Möllmann, A., Gedamu, D., Vivo, P., Frohnhoven, R., Stadler, D., Fischer, T., Ka, I., Steinhorst, M., Nechache, R., Rosei, F., Cloutier, S. G., Kirchartz, T., Mathur, S.
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Highly ductile amorphous oxide at room temperature and high strain rate

Oxide glasses are an integral part of the modern world, but their usefulness can be limited by their characteristic brittleness at room temperature. We show that amorphous aluminum oxide can permanently deform without fracture at room temperature and high strain rate by a viscous creep mechanism. These thin-films can reach flow stress at room temperature and can flow plastically up to a total elongation of 100%, provided that the material is dense and free of geometrical flaws. Our study demonstrates a much higher ductility for an amorphous oxide at low temperature than previous observations. This discovery may facilitate the realization of damage-tolerant glass materials that contribute in new ways, with the potential to improve the mechanical resistance and reliability of applications such as electronic devices and batteries.

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Contributors: Frankberg, E. J., Kalikka, J., Ferré, F. G., Joly-Pottuz, L., Salminen, T., Hintikka, J., Hokka, M., Koneti, S., Douillard, T., Le Saint, B., Kreiml, P., Cordill, M. J., Epicier, T., Stauffer, D., Vanazzi, M., Roiban, L., Akola, J., Fonzo, F. D. , Levänen, E., Masenelli-Varlot, K.
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High rate anaerobic treatment of LCFA-containing wastewater at low temperature

Fats, oil and grease (FOG) are a significant constituent in numerous wastewaters such as those in dairy industry. The hydrolysis of FOG result in the production of long chain fatty acids (LCFA) which destabilize the anaerobic treatment process due to their physico-chemical and microbial toxicity effects. Harnessing the high methanogenic potential of FOG necessitates effective treatment of high LCFA loads, wherein the feasibility of LCFA treatment at low temperatures has been not investigated up to now. The aim of this thesis was to study the feasibility of high-rate anaerobic treatment of LCFA-rich wastewaters at low ambient temperatures using dairy wastewater.

The screening of mesophilic inocula for treatment of mixed LCFA containing synthetic dairy wastewater (SDW) in batch studies showed that granular sludge inoculum achieved faster and higher methane yields (76-82% of theoretical yield) than the two municipal digestates (1-72%) at both 20 and 10°C. The LCFA
degradation capacity in the granular sludge inoculum was attributed to the presence of β-oxidizing bacteria from the family Syntrophaceae (Syntrophus and uncultured taxa), the acetotrophic activity of Methanosaeta and the putative syntrophic acetate oxidizing bacteria (SAOB).

Continuous high-rate treatment of SDW was found to be feasible in expanded granular sludge bed (EGSB) reactors at 20°C (hydraulic retention time (HRT) 24 h, LCFA loading rate (OLR) 670 mgCOD-LCFA/L·d) with a soluble COD (sCOD) removal of 84–91% and methane yield of 44–51%. SDW feeding for longer than two months resulted in LCFA accumulation, which led to granular sludge flotation (36-57%) and disintegration (reduction in d50 of 24–33% and 75–84% in settled and washed-out granules, respectively). To counter the LCFA induced granular sludge disintegration and flotation, a novel reactor type, dynamic sludge chamber-fixed film (DSC-FF), was designed and achieved sCOD removal of 87-98% at HRTs from 12-72 h (LCFA loading rate 220-1333 mgCOD-LCFA/L·d) at 20°C. Moreover, even at the 12 h HRT, the unsaturated LCFAs
(linoleate and oleate) were treated and only part of saturated LCFAs (stearate, palmitate) remained after treatment in the DSC-FF reactors. An increased methanogenic activity was established in the reactor sludges during reactor runs, which was evidenced by a higher acetotrophic activity in the granular sludge (from DSC), and a higher hydrogenotrophic activity in the biofilm (from FF) indicating development of distinct metabolic capabilities in the different reactor compartments.

High throughput 16S rRNA sequencing showed that the relative abundance of the acetoclastic methanogen, Methanosaeta, increased in EGSB reactors and in the active microbiomes of granules (from DSC) and biofilm (from FF) when fed with increasing LCFA concentrations. This suggested acetoclastic methanogenesis as the predominant methanogenesis pathway for SDW and presumably, LCFA degradation at 20°C. Relative abundances of the taxa known to have β-oxidizing and methanogenic activity were high in the active microbiomes during SDW treatment in DSC-FF reactors at 20°C. The biofilm
microbiome (from FF) had a prominent presence of the β-oxidizing bacteria Syntrophus and of the hydrogenotrophic methanogen Methanospirillum in comparison to the presence of the acetogenic bacteria, Syntrophobacter, Desulfobulbus, and Geobacter, and of the acetoclastic methanogen in the
granular sludge microbiome, suggesting a role of these different taxa during LCFA degradation.

In summary, this work demonstrated successful inoculum selection at low temperatures (10 and 20°C), and high-rate anaerobic LCFA degradation at 20°C using novel reactor design (here, DSC-FF). The key bacterial and archaeal taxa involved in the anaerobic conversion of LCFA to methane at 20°C were also
deduced.

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High rate autotrophic denitrification in fluidized-bed biofilm reactors
High rate, high efficiency thiosulfate-driven autotrophic denitrification and denitritation with Thiobacillus denitrificans dominated biofilms were achieved in fluidized-bed reactors (FBRs) operated at 20.0 ± 2.0 and 30.0 ± 0.2 °C. Complete nitrate removal was obtained even at nitrate loading rate and hydraulic retention time (HRT) of 600 mg L−1 h−1 and 10 min, respectively. Further decrease of HRT to 5 min resulted in 50% of nitrate removal efficiency. Nitrite did not accumulate when nitrate was used as electron acceptor unless HRT was decreased to 5 min. Effluent pH remained at 5.8 during denitrification. When nitrite was supplemented as the electron acceptor, denitritation effectively proceeded with the highest nitrite loading rate of 228 mg L−1 h−1. Similar denitrification and denitritation performances were obtained at 20.0 ± 2.0 and 30.0 ± 0.2 °C. Batch assays conducted at temperature range from 1 to 46 °C, however, showed a significant impact of temperature on autotrophic denitrification. Ratkowsky model was used to estimate the minimum, optimal and maximum growth temperatures of T. denitrificans dominated culture that were below 1, 26.6 and 50.8 °C, respectively.

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Ratings:
Scopus rating (2016): CiteScore 9.7 SJR 1.758 SNIP 1.952
Original language: English
DOIs:
10.1016/j.cej.2015.09.074
Research output: Contribution to journal › Article › Scientific › peer-review

High-solids anaerobic digestion requires a trade-off between total solids, inoculum-to-substrate ratio and ammonia inhibition
Increasing total solids in anaerobic digestion can reduce the methane yield by highly complex bio-physical–chemical mechanisms. Therefore, understanding those mechanisms and their main drivers becomes crucial to optimize this waste treatment biotechnology. In this study, seven batch experiments were conducted to investigate the effects of increasing the initial total solids in high-solids anaerobic digestion of the organic fraction of municipal solid waste. With inoculum-to-substrate ratio = 1.5 g VS/g VS and maximum total solids ≤ 19.6%, mono-digestion of the organic fraction of municipal solid waste showed a methane yield = 174–236 NmL CH_4/g VS. With inoculum-to-substrate ratio ≤ 1.0 g VS/g VS and maximum total solids ≥ 24.0%, mono-digestion experiments acidified. Co-digestion of the organic fraction of municipal solid waste and beech sawdust permitted to reduce the inoculum-to-substrate ratio to 0.16 g VS/g VS while increasing total solids up to 30.2%, though achieving a lower methane yield (117–156 NmL CH_4/g VS). At each inoculum-to-substrate ratio, higher total solids corresponded to higher ammonia and volatile fatty acid accumulation. Thus, a 40% lower methane yield for mono-digestion was observed at a NH_3 concentration ≥ 2.3 g N–NH_3/kg reactor content and total solids = 15.0%. Meanwhile, co-digestion lowered the nitrogen content, being the risk of acidification exacerbated only at total solids ≥ 20.0%. Therefore, the biodegradability of the substrate, as well as the operational total solids and inoculum-to-substrate ratio, are closely interrelated parameters determining the success of methanogenesis, but also the risk of ammonia inhibition in high-solids anaerobic digestion.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Materials Science and Environmental Engineering, Department of Civil and Mechanical Engineering, University of Cassino and Southern Lazio, LBE, INRA, ENEA/CREATE/Università Degli Studi Napoli Federico II

Contributors: Pastor-Poquet, V., Papirio, S., Trably, E., Rintala, J., Escudié, R., Esposito, G.
Publication date: 2019
Peer-reviewed: Yes

Publication information
Journal: INTERNATIONAL JOURNAL OF ENVIRONMENTAL SCIENCE AND TECHNOLOGY
ISSN (Print): 1735-1472
Ratings:

Scopus rating (2019): CiteScore 2.9 SJR 0.518 SNIP 1.016
Original language: English
ASJC Scopus subject areas: Environmental Engineering, Environmental Chemistry, Agricultural and Biological Sciences(all)
Keywords: Batch experiments, Co-digestion, High-solids anaerobic digestion, Methane yield, Organic fraction of municipal solid waste, Thermophilic, Volatile fatty acids
DOIs:

10.1007/s13762-019-02264-z
Source: Scopus
Source ID: 85061488051
Research output: Contribution to journal › Article › Scientific › peer-review

Historian hajuista tuoksujen tulevaisuuteen: pääkaupunkiseudun jätevedenpuhdistuksen keskeiset päätökset Espoon näkökulmasta
"From Stinky History to Fragrant Future. Waste water treatment of the metropolitan area - central decisions on the point of view of Espoo is written by Adjunct Professor, PhD Petri S Juuti. The book examines how water and waste water services started and developed in Espoo from the 1950s to the 2000s. Furthermore, it is discussed what are the challenges of the future looked from the point of view of the professionals of the water sector."

Tässä kirjassa käydään läpi pk-seudun jätevedenkäsittelyn historia ja yhteistyövaiheet aina 1950-luvulta 2010-luvulle asti Espoon näkökulmasta. Tutkimuksen pääkysymyksiä ovat mm.:

– Miksi jätevesien puhdistaminen on keskitetty vain yhteen puhdistamoon?
– Miksi Espoossa tehdään ylikunnallista yhteistyötä jätevesienpuhdistuksessa?
– Miten jätevesien puhdistusyhteistyö on alkanut ja muuttunut vuosien varrella?
– Miksi puhdistetaan naapurikuntien jätevesiä?
– Millaista keskustelua jätevedet ovat herättäneet menneisyydessä ja millaista tulevaisuutta koskevaa keskustelua niistä on käyty?

Oikean strategian toteuttamisessa tarvitaan yhteistyötä ja osaavaa johtamista. Espoo on voinut historiassa käyttää omien resurssiensa lisäksi vesihuollossa myös naapurikuntien resursseja. Nyt tarkastelukohteena olevan jätevesienpuhdistuksen osalta tämä on tarkoittanut sitä, että naapurikunnat ovat maksaneet osansa ja osin enemmänkin kuin osansa jätevesiensä puhdistamisesta ja varsinkin Suomenojan jätevedenpuhdistamosta. Näiden lisäresurssien turvin historian saatossa kertyneet resurssit ovat mahdollistaneet nykyisen hyvän tilanteen pitkän tähtäimen strategisten päätösten avulla. Näistä strategisista päätöksistä yksi konkreettisin näyttö ovat jätevesiä koskevat sopimukset naapurikuntien kanssa. Sopimukset ja niiden takana olleet päätökset ovat hyvin kaukonäköisiä ja kaikkia osapuolia sitovia.

Ne osaltaan mahdollistavat, että valittavana on ollut kehityspolkuja, joita kaikkialla ei ole ollut käytössä. Vuoden 2010 alusta alkaen Espoon vesihuolto on toiminut yhdessä pk-seudun organisaatiossa alueen muiden vesilaitosten kanssa, HSY:n organisaation alaisuudessa.

General information
Publication status: Published
MoE publication type: C1 Separate scientific books
Organisations: Civil Engineering
Contributors: Juuti, P.
Number of pages: 280
Publication date: 2017

Publication information
Publisher: Tampere University Press
ISBN (Electronic): 978-952-03-0420-1
Original language: Finnish
DOIs:

10.26530/OAPEN_628607
URLs:

http://urn.fi/URN:ISBN:978-952-03-0420-1

URLs:
http://www.oapen.org/search?identifier=628607
Research output: Book/Report › Book › Scientific › peer-review

Historian hajuista tuoksujen tulevaisuuteen: Pääkaupunkiseudun jäätevedenpuhdistuksen keskeiset päätökset Espoon näkökulmasta

General information
Publication status: Published
Organisations: Civil Engineering
Contributors: Katko, T. S.
Number of pages: 1
Publication date: 2017

Publication information
Place of publication: Tampere
Publisher: TamPub
Year: 2017
ISBN (Print): 978-952-03-0419-5
Original language: Finnish
URLs:
https://tampub.uta.fi/handle/10024/100991
Research output: Other contribution › Scientific

Historical development of water and sanitation services

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P. S., Katko, T. S.
Pages: 25-38
Publication date: 2005

Host publication information
Title of host publication: Water, Time and European Cities. History matters for the Futures
Place of publication: Tampere
Publisher: Tampere University Press
Editors: Juuti, P. S., Katko, T. S.
ISBN (Print): 951-44-6337-4
URLs:
http://urn.fi/urn:isbn:951-44-6337-4

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 18529
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Historical development paths and means for winning the challenge of aging water services infrastructure

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Civil Engineering, Research group: Capacity Development of Water and Environmental Services CADWES
Contributors: Rajala, R., Juuti, P., Hukka, J., Katko, T. S.
Number of pages: 16
Pages: 15-30
Publication date: 2019

Host publication information
Title of host publication: Resilient Water Services and Systems: The Foundation of Well-Being
Publisher: IWA Publishing
ISBN (Print): 9781780409764

ISBN (Electronic): 9781780409771
DOIs:
10.2166/9781780409771_0015
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

History of water and sanitation services in Finland in the urban-rural mixture : The Case of the City of Tampere, Finland

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, Former organisation of the author
Contributors: Katko, T. S., Juuti, P. S.
Number of pages: 22
Pages: 498-519
Publication date: 2014

Host publication information
Title of host publication: A History of Water: Water and Urbanization: Series III, Volume 1
Place of publication: London
Publisher: I. B. Tauris
Editors: Tvedt, T., Oestigaard, T.
ISBN (Print): 978-1780764474

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-12-11
Publisher name: I. B. Tauris
Source: researchoutputwizard
Source ID: 681
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

HPLC-SEC: a new approach to characterise complex wastewater effluents
This work investigates the use of HPLC-SEC to characterise dissolved organic matter (DOM) of complex wastewater effluents. A silica-based column, sodium acetate eluent and multiple detections were employed: UV-254 absorbance for humictype, and tryptophan-like (Ex/Em = 270/355) and tyrosine-like (Ex/Em = 270/310) fluorescence for protein type compounds. Effects of eluent pH, eluent ionic strength and injection volume on separation efficiency were tested. Humic-type and protein-type fractions were clearly differentiated and eluted within and out of calibration range. Eluent ionic strength had the greatest influence on global resolution; the lowest eluent concentration of 0.01 M produced the best separation for all wastewater effluents tested at any detection. UV-254 absorbance was higher at neutral and basic eluent pH while tryptophan-like fluorescence depended on the sample composition rather than on the eluent pH or ionic strength. Tyrosine-like fluorescence decreased significantly with the increase of eluent ionic strength. Accurate molecular weight measurements could not be done, the separation being influenced by secondary interactions, but could be approximated using separate calibrations with sodium salts of polystyrene-sulfonates and protein standards. The results show that this method is suitable for determining DOM in wastewater at low eluent concentrations (up to 0.03 M), at neutral or slightly basic pH.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Degree Programme in Energy and Environmental Engineering, Tampere University of Applied Sciences, Department of Biological and Environmental Science, University of Jyväskylä
Contributors: Szabo, H. M., Lepistö, R., Tuhkanen, T.
Number of pages: 14
Pages: 257-270
Publication date: 19 Feb 2016
Peer-reviewed: Yes

Publication information
Journal: International Journal of Environmental Analytical Chemistry
Volume: 96
Issue number: 3
ISSN (Print): 0306-7319
Ratings:
Scopus rating (2016): CiteScore 2.5 SJR 0.368 SNIP 0.501
Original language: English
ASJC Scopus subject areas: Analytical Chemistry, Environmental Chemistry, Soil Science, Health, Toxicology and Mutagenesis, Pollution, Waste Management and Disposal, Water Science and Technology, Public Health, Environmental

and Occupational Health
Keywords: DOM, Fluorescence, greywater, humic, ionic strength, proteins, tryptophan, UV-254
DOIs:
10.1080/03067319.2016.1150463

Bibliographical note
EXT="Tuhkanen, Tuula"
Source: Scopus
Source ID: 84961206778
Research output: Contribution to journal › Article › Scientific › peer-review

Hybrid barrier films by atmospheric inline plasma deposition on sol-gel coated PE-cardboard

General information
Publication status: Published
MoE publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Energy and Process Engineering
Contributors: Nättinen, K., Nikkola, J., Mannila, J., Vartiainen, J., Tuominen, M., Lavonen, J.
Pages: 8 p
Publication date: 2009

Host publication information
Title of host publication: Coatings for Plastics at NPE 2009, June 23-24, 2009, McCormick Place, Chicago, IL

Bibliographical note
Contribution: organisation=epr pap,FACT1=1
Source: researchoutputwizard
Source ID: 10943
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific

Hydrodynamic drag and velocity of micro-bubbles in dilute paper machine suspensions

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Haapala, A., Honkanen, M., Liimatainen, H., Stoor, T., Niinimäki, J.
Pages: 956-964
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Chemical Engineering Journal
Volume: 162
ISSN (Print): 1385-8947
Ratings:
Scopus rating (2010): SJR 1.246 SNIP 1.54
Original language: English
DOIs:
10.2495/MPF090291
URLs:
http://www.elsevier.com/locate/cej

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 7971
Research output: Contribution to journal › Article › Scientific › peer-review

Hydrogen sulfide removal from synthetic biogas using anoxic biofilm reactors

The aim of this work was to develop and study anoxic bioreactors for the removal of reduced inorganic sulfur compounds from liquid and gaseous waste streams. In addition, the aim was to enable process integration for the simultaneous treatment of H2S contaminated gas streams and NO3--containing wastewater. The experiments related to sulfide oxidation in the liquid phase were conducted in two different attached growth bioreactors, i.e. a fluidized-bed reactor (FBR)

and a moving bed biofilm reactor (MBBR), inoculated with the same mixed culture of sulfur-oxidizing nitrate-reducing (SO-NR) bacteria. The bioreactors were operated under different nitrogen-to-sulfur (N/S) molar ratios using S2O32- and NO3- as an energy source and electron acceptor, respectively. Results revealed that both the FBR and MBBR achieved S2O32- removal efficiencies (RE) >98% and completely removed NO3- at an N/S ratio of 0.5. Under severe nitrate limitation (N/S ratio of 0.1), the S2O32- RE in the MBBR (37.8%) was higher than that observed in the FBR (26.1%). In addition, the MBBR showed better resilience to nitrate limitation than the FBR as the S2O32- RE was recovered to 94% within 1 day after restoring the feed N/S ratio to 0.5, while it took 3 days to obtain 80% S2O32- RE in the FBR. Artificial neural network models were successfully used to predict the FBR and MBBR performance, i.e. S2O32- and NO3- RE as well as sulfate production. The SO-NR biomass from the MBBR was used to inoculate an anoxic biotrickling filter (BTF), which was studied for simultaneous treatment of H2S and NO3- containing waste streams. In the anoxic BTF, a maximum H2S elimination capacity (EC) of 19.2 g S m-3 h-1 (99% RE) was obtained at an inlet H2S load of 20.0 g S m-3 h-1 (~500 ppmv) and an N/S ratio of ~1.7. As some NO3--containing wastewaters can also contain organic compounds, the anoxic BTF inoculated with Paracoccus versutus strain MAL 1HM19 was studied for the simultaneous treatment of H2S, NO3- and organic carbon containing waste streams. With this BTF, NO3- and acetate removal rates of 16.7 g NO3--N m-3 h-1 and 42.0 g acetate m-3 h-1, respectively, were achieved, which was higher than the values observed in the BTF inoculated with the mixed culture of autotrophic SO-NR bacteria (11.1 g NO3--N m-3 h-1 and 10.2 g acetate m-3 h-1). Anoxic BTFs were operated under several transient conditions (i.e. varied gas and trickling liquid flow rates, intermittent NO3- supply and H2S shock loads) to evaluate the impacts of sudden changes that usually occur in practical applications. The different transient conditions significantly affected the H2S EC of the anoxic BTF. After applying H2S shock loads, the H2S RE fully recovered to >99% within 1.7 days after resuming normal operation. In summary, the MBBR was more effective for the removal of S2O32- than the FBR, especially under nitrate limited conditions. Based on the short recovery times after exposure to transient-state conditions, the anoxic MBBR and BTF were found to be resilient and robust systems for removal of reduced sulfur compounds under autotrophic and mixotrophic conditions.

General information
Publication status: Published
MoE publication type: G5 Doctoral dissertation (article)
Organisations: Materials Science and Environmental Engineering
Contributors: Khanongnuch, R.
Number of pages: 187
Publication date: 21 May 2019

Publication information
Publisher: Tampere University
Original language: English

Publication series
Name: Tampere University Dissertations
URLs:

http://urn.fi/URN:NBN:fi:tuni-201906192105. Embargo ended: 21/05/20
Research output: Book/Report › Doctoral thesis › Collection of Articles

Hydrolysed cellulose material as sulfate reduction electron donor to treat metal- and sulfate containing waste water

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Former organisation of the author
Contributors: Lakaniemi, A., Nevatalo, L., Kaksonen, A., Puhakka, J.
Pages: 326-326
Publication date: 2007
Peer-reviewed: Yes

Publication information
Journal: Advanced Materials Research
Volume: 20-21
ISSN (Print): 1022-6680
Ratings:

Scopus rating (2007): SJR 0.18 SNIP 0.753
Original language: English
DOIs:

10.4028/www.scientific.net/AMR.20-21.326

Bibliographical note
Contribution: organisation=bio,FACT1=1

Source: researchoutputwizard
Source ID: 14835
Research output: Contribution to journal › Article › Scientific › peer-review

Hydrothermal carbonization of pulp mill streams

The progress of the conversion, the yield, the structure and the morphology of the produced carbonaceous materials as a function of time were systematically studied with pyrolysis-GC/FID and FESEM microscope. The conversion of galactoglucomannan, bleached kraft pulp and TEMPO oxidized cellulose nanofibrils followed the reaction route of glucose being slower though with fibrous material, higher molar mass and viscosity. The conversion of kraft lignin was minor following completely different reaction route. Carbonaceous particles of different shape and size were produced with yields between 23% and 73% after 4 h with being higher for lignin than carbohydrates. According to the results, potential pulp mill streams represent lignocellulosic resources for generation of carbonaceous materials.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Materials Science, Research group: Materials Characterization, VTT Technical Research Centre of Finland
Contributors: Wikberg, H., Ohra-aho, T., Honkanen, M., Kanerva, H., Harlin, A., Vippola, M., Laine, C.
Number of pages: 9
Pages: 236-244
Publication date: 1 Jul 2016
Peer-reviewed: Yes

Publication information

Journal: Bioresource Technology
Volume: 212
ISSN (Print): 0960-8524
Ratings:

Scopus rating (2016): CiteScore 9.9 SJR 2.215 SNIP 1.945
Original language: English
ASJC Scopus subject areas: Bioengineering, Environmental Engineering, Waste Management and Disposal
Keywords: Galactoglucomannan, Hydrothermal carbonization, Kraft lignin, Kraft pulp, Pulp mill
DOIs:

10.1016/j.biortech.2016.04.061

Bibliographical note

EXT="Harlin, Ali"
Source: Scopus
Source ID: 84963954557
Research output: Contribution to journal › Article › Scientific › peer-review

Hyvän veden ja hyvien yhteyksien kaupunki - Riihimäen Veden historia

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Department of Civil Engineering, Former organisation of the author
Contributors: Juuti, P., Rajala, R., Pietilä, P., Katko, T.
Pages: 36-40
Publication date: 2011
Peer-reviewed: Yes

Publication information

Journal: Vesitalous
Volume: 52
Issue number: 5
ISSN (Print): 0505-3838
Original language: Finnish
URLs:

http://www.vesitalous.fi

Bibliographical note

Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 6248
Research output: Contribution to journal › Article › Scientific › peer-review

Hyvän veden ja hyvien yhteyksien kaupunki : Riihimäen Veden historia

General information
Publication status: Published
MoE publication type: C1 Separate scientific books
Organisations: Department of Chemistry and Bioengineering, Former organisation of the author
Contributors: Juuti, P., Rajala, R. P., Pietilä, P. E., Katko, T. S.
Number of pages: 336
Publication date: 2010

Publication information
Publisher: Riihimäen Vesi
ISBN (Print): 978-952-5571-29-5
Original language: Finnish
Electronic versions:

juuti_hyvan_veden_ja_hyvien_yhteyksien_kaupunki.pdf
URLs:

http://urn.fi/URN:NBN:fi:tty-2011041513430

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 8244
Research output: Book/Report › Book › Scientific › peer-review

Hyvien yhteyksien ja hyvän veden kaupunki

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Civil Engineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, University of Tampere
Contributors: Juuti, P., Rajala, R., Pietilä, P.
Pages: 314-333
Publication date: 2010

Host publication information
Title of host publication: Hyvän veden ja hyvien yhteyksien kaupunki : Riihimäen Veden historia
Publisher: TamPub
Editors: Juuti, P., Rajala, R., Pietilä, P., Katko, T.
ISBN (Print): 978-952-5571-29-5
ISBN (Electronic): 978-951-44-8136-9
URLs:

http://urn.fi/urn:isbn:978-951-44-8136-9
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Identification of Wastewater Leaching into the Wells by HPLC-SEC Using UV and Fluorescence Detection

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering
Contributors: Szabo, H. M., Tuhkanen, T.
Pages: 893-897
Publication date: 2011

Host publication information
Title of host publication: Survival and Sustainability : Environmental concerns in the 21st Century
Publisher: Springer Berlin Heidelberg

Editors: Huseyin, G., Umut, T., James, W. L.
ISBN (Print): 978-3-540-95990-8
ISBN (Electronic): 978-3-540-95991-5

Publication series
Name: Environmental Earth Sciences
Publisher: Springer Berlin Heidelberg
DOIs:
10.1007/978-3-540-95991-5_84

Bibliographical note
ei ut-numeroa 17.5.2014
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 7342
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Ikääntyvä infra - vesihuollon keskeisin haaste

General information
Publication status: Published
MoE publication type: A2 Review article in a scientific journal
Organisations: Department of Chemistry and Bioengineering
Contributors: Heino, O., Katko, T., Takala, A.
Pages: 22-24
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Vesitalous
Issue number: 6
ISSN (Print): 0505-3838
Original language: Finnish

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 8050
Research output: Contribution to journal › Review Article › Scientific › peer-review

Ilmasto muuttuu, riittääkö vesi?

General information
Publication status: Published
MoE publication type: E1 Popularised article, newspaper article
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P., Katko, T.
Publication date: 2007
Peer-reviewed: Unknown

Publication information
Journal: Aamulehti
ISSN (Print): 0355-6913
Original language: English

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14483
Research output: Contribution to journal › Article › General public

Impact of heavy metals on denitrification of simulated mining wastewaters

General information
Publication status: Published

MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Urban circular bioeconomy (UrCirBio)
Contributors: Zou, G., Ylinen, A., Di Capua, F., Papirio, S., Lakaniemi, A., Puhakka, J.
Number of pages: 4
Pages: 500-503
Publication date: 2013
Peer-reviewed: Yes

Publication information
Journal: Advanced Materials Research
Volume: 825
ISSN (Print): 1022-6680
Ratings:

Scopus rating (2013): CiteScore 0.11 SJR 0.142 SNIP 0.197
Original language: English
DOIs:

10.4028/www.scientific.net/AMR.825.500

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-11-29
Publisher name: Trans Tech Publications Ltd.
Source: researchoutputwizard
Source ID: 3792
Research output: Contribution to journal › Article › Scientific › peer-review

Impacts of changing operational parameters of in situ chemical oxidation (ISCO) on removal of aged PAHs from soil

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Cajal-Marinosa, P., de la Calle, R., Rivas, F. J., Tuhkanen, T.
Pages: 429-436
Publication date: 2012
Peer-reviewed: Yes

Publication information
Journal: Journal of Advanced Oxidation Technologies
Volume: 15
Issue number: 2
ISSN (Print): 1203-8407
Ratings:

Scopus rating (2012): CiteScore 1.4 SJR 0.408 SNIP 0.495
Original language: English

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Publisher name: Science & Technology Integration,
Source: researchoutputwizard
Source ID: 3951
Research output: Contribution to journal › Article › Scientific › peer-review

Impacts of short-term temperature fluctuations on biohydrogen production and resilience of thermophilic microbial communities

Anaerobic microflora enriched for dark fermentative H2 production from a mixture of glucose and xylose was used in batch cultivations to determine the effects of sudden short-term temperature fluctuations on H2 yield and microbial community composition. Batch cultures initially cultivated at 55 °C (control) were subjected to downward (from 55 °C to 35 °C or 45 °C) or upward (from 55 °C to 65 °C or 75 °C) temperature shifts for 48 h after which, each culture was transferred to a fresh medium and cultivated again at 55 °C for two consecutive batch cycles. The average H2 yield obtained during the first cultivation at 55 °C was 2.1 ± 0.14 mol H2 mol-1 hexose equivalent. During the temperature shifts, the obtained H2 yields were 1.8 ± 0.15, 1.6 ± 0.27 and 1.9 ± 0.00 mol H2 mol-1 hexose equivalent at 35 °C, 45 °C and 65 °C, respectively, while no metabolic activity was observed at 75 °C. The sugars were completely utilized during the 48 h temperature shift to 35 °C but not at 65 °C and 45 °C. At the end of the second cycle after the different temperature shifts, the H2 yield obtained was 96.5, 91.6, 79.9 and 54.1% (second cycle after temperature shift to 35 °C, 45 °C, 65 °C and 75 °C, respectively) when compared to the average H2 yield produced in the control at 55 °C. Characterization of the microbial communities present in the control culture at 55 °C showed the predominance of Thermoanaerobacteriales, Clostridiales

and Bacilliales. The microbial community composition differed based on the fluctuation temperature with Thermoanaerobacteriales being most dominant during the upward temperature fluctuations and Clostridiales being the most dominant during the downward temperature fluctuations.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Materials Science and Environmental Engineering, Research group: Bio- and Circular Economy, INRA
Contributors: Okonkwo, O., Escudié, R., Bernet, N., Mangayil, R., Lakaniemi, A., Trably, E.
Pages: 8028-8037
Publication date: 29 Mar 2019
Peer-reviewed: Yes

Publication information
Journal: International Journal of Hydrogen Energy
Volume: 44
Issue number: 16
ISSN (Print): 0360-3199
Ratings:

Scopus rating (2019): CiteScore 8 SJR 1.141 SNIP 1.377
Original language: English
Electronic versions:

Temperature fluctuation_Okonkwo
DOIs:

10.1016/j.ijhydene.2019.01.256
URLs:

http://urn.fi/URN:NBN:fi:tty-201905201649
Research output: Contribution to journal › Article › Scientific › peer-review

Importance and challenges of sharing experiences among an international and interdisciplinary group of doctoral students

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Contributors: Kurki, V., Sidaraviciute, R., Sörensen, J., Kibocha, S. N., Retike, I., Ikobe, G., Tichonovas, M., Elijosiute, E., Rajala, R.
Number of pages: 7
Pages: 45-51
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Ympäristöhistoria: Finnish Journal of Environmental History
Issue number: 1/2015
ISSN (Print): 1799-6953
Original language: English
URLs:

http://www.uta.fi/yky/tutkimus/historia/projektit/iehg/Ymparistohistoria/No1_2015.html

Bibliographical note
EXT="Kibocha, Samuel Ngari"
EXT="Rajala, Riikka"
Research output: Contribution to journal › Article › Scientific › peer-review

Improved bioconversion of crude glycerol to hydrogen by statistical optimization of media components
Bioconversion of crude glycerol to hydrogen has gained importance as it addresses both sustainable energy production and waste disposal issues. Until recently, statistical optimizations of crude glycerol bioconversion to hydrogen have been greatly focused on pure strains. In this study, biohydrogen production from crude glycerol by an enriched microbial culture (predominated with Clostridium species) was improved by statistical optimization of media components. Plackett-Burman design identified $MgCl_2.6H_2O$ and KCl with negative effect on hydrogen production and selected NH_4Cl, K_2HPO_4 and KH_2PO_4 as significant variables. Box-Behnken design indicated the optimal region beyond design area and studies were continued by ridge analysis. Central composite face centered design envisaged a maximal hydrogen yield of 1.41mol-H_2/mol-$glycerol_{consumed}$ at concentrations 4.40g/L and 2.27g/L for NH_4Cl and KH_2PO_4 respectively. Confirmation

experiment with the optimized media (NH_4Cl, 4.40g/L; K_2HPO_4, 1.6g/L; KH_2PO_4, 2.27g/L; $MgCl_2.6H_2O$, 1.0g/L; KCl, 1.0g/L; Na-acetate.$3H_2O$, 1.0g/L and tryptone, 2.0g/L) revealed an excellent correlation between predicted and experimental hydrogen yield. Optimization of media components by design of experiments enhanced hydrogen yield by 29%.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Tampere University of Technology, Department of Signal Processing, Urban circular bioeconomy (UrCirBio)
Contributors: Mangayil, R., Aho, T., Karp, M., Santala, V.
Number of pages: 7
Pages: 583-589
Publication date: 1 Mar 2015
Peer-reviewed: Yes

Publication information

Journal: Renewable Energy
Volume: 75
ISSN (Print): 0960-1481
Ratings:

Scopus rating (2015): CiteScore 7.2 SJR 1.767 SNIP 2.098
Original language: English
ASJC Scopus subject areas: Renewable Energy, Sustainability and the Environment
Keywords: Biohydrogen, Crude glycerol, Optimization, Response surface methodology
DOIs:

10.1016/j.renene.2014.10.051
URLs:

http://www.scopus.com/inward/record.url?scp=84910051633&partnerID=8YFLogxK (Link to publication in Scopus)

Bibliographical note

Available online 3 November 2014 : Volume 75, March 2015, Pages 583-589
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-12-12
Publisher name: Pergamon; The World Renewable Energy Network
Source: researchoutputwizard
Source ID: 1020
Research output: Contribution to journal › Article › Scientific › peer-review

Improved water services cooperation through clarification of rules and roles

Water services face global challenges, many of which are institutional by nature. While technical solutions may suit several situations, institutional frameworks are likely to vary more. On the basis of constructive research approach and new institutional economics we analyze and illustrate water services and the roles of various water sector actors in Finnish water utility setting using the "soccer analogy" by the Nobel Laureate D.C. North: Institutions are the "formal and informal rules of the game" while organizations are the "players". Additionally, we assess the Finnish water governance system and discuss issues of scale and fragmentation and distinguish terms water provision and production. Finally, we elaborate the limitations of the soccer analogy to water services through ownership of the systems. According to the soccer analogy, inclusive institutional development requires skillful players (competent staff), team play (collaboration), proper coaching (education), supporters (citizens, media), managers (policymakers), and referees (authorities). We argue that institutional diversity and player/stakeholder collaboration are the foundation for enhancing good multi-level water governance, and that water management, although fragmented, should be seen as a connector of different sectors. For successful outcomes, scientific results should be communicated to public in more common language.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Civil Engineering, Research group: Capacity Development of Water and Environmental Services CADWES
Contributors: Inha, L. M., Katko, T. S., Rajala, R. P.
Publication date: 19 Oct 2019
Peer-reviewed: Yes

Publication information

Journal: Water (Switzerland)
Volume: 11
Issue number: 10

Article number: 2172
ISSN (Print): 2073-4441
Ratings:

Scopus rating (2019): CiteScore 3 SJR 0.657 SNIP 1.074
Original language: English
ASJC Scopus subject areas: Biochemistry, Geography, Planning and Development, Aquatic Science, Water Science and Technology
Keywords: Good governance, Institutional diversity, Institutions, Rules and roles, Soccer analogy, Stakeholder collaboration
Electronic versions:

water-11-02172
DOIs:

10.3390/w11102172
URLs:

http://urn.fi/URN:NBN:fi:tuni-201911186009
Source: Scopus
Source ID: 85074329077
Research output: Contribution to journal › Article › Scientific › peer-review

Increasing oxygen deficiency changes rare and moderately abundant bacterial communities in coastal soft sediments

Coastal hypoxia is a major environmental problem worldwide. Hypoxia-induced changes in sediment bacterial communities harm marine ecosystems and alter biogeochemical cycles. Nevertheless, the resistance of sediment bacterial communities to hypoxic stress is unknown. We investigated changes in bacterial communities during hypoxic-anoxic disturbance by artificially inducing oxygen deficiency to the seafloor for 0, 3, 7, and 48 days, with subsequent molecular biological analyses. We further investigated relationships between bacterial communities, benthic macrofauna and nutrient effluxes across the sediment-water-interface during hypoxic-anoxic stress, considering differentially abundant operational taxonomic units (OTUs). The composition of the moderately abundant OTUs changed significantly after seven days of oxygen deficiency, while the abundant and rare OTUs first changed after 48 days. High bacterial diversity maintained the resistance of the communities during oxygen deficiency until it dropped after 48 days, likely due to anoxia-induced loss of macrofaunal diversity and bioturbation. Nutrient fluxes, especially ammonium, correlated positively with the moderate and rare OTUs, including potential sulfate reducers. Correlations may reflect bacteria-mediated nutrient effluxes that accelerate eutrophication. The study suggests that even slightly higher bottom-water oxygen concentrations, which could sustain macrofaunal bioturbation, enable bacterial communities to resist large compositional changes and decrease the harmful consequences of hypoxia in marine ecosystems.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Materials Science and Environmental Engineering, Research group: Bio- and Circular Economy, Helsinki University, Karolinska Institutet, Univ Helsinki, University of Helsinki, Dept Geog, Stockholm University
Contributors: Sinkko, H., Hepolehto, I., Lyra, C., Rinta-Kanto, J. M., Villnäs, A., Norkko, A., Timonen, S.
Publication date: 8 Nov 2019
Peer-reviewed: Yes

Publication information

Journal: Scientific Reports
Volume: 9
Article number: 16341
ISSN (Print): 2045-2322
Ratings:

Scopus rating (2019): CiteScore 7.2 SJR 1.341 SNIP 1.365
Original language: English
Keywords: microbial ecology, water microbiology
Electronic versions:

s41598-019-51432-1
DOIs:

10.1038/s41598-019-51432-1
URLs:

http://urn.fi/URN:NBN:fi:tuni-201911286382
Research output: Contribution to journal › Article › Scientific › peer-review

Indigenous practices of water management for sustainable services: Case of Borana and Konso, Ethiopia

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Contributors: Behailu, B. M., Pietilä, P. E., Katko, T. S.
Number of pages: 11
Pages: 1-11
Publication date: 6 Dec 2016
Peer-reviewed: Yes

Publication information
Journal: SAGE OPEN
Volume: 6
Issue number: 4
ISSN (Print): 2158-2440
Ratings:

Scopus rating (2016): CiteScore 0.7 SJR 0.219 SNIP 0.536
Original language: English
Electronic versions:

Indigenous Practices of Water Management for Sustainable Services
DOIs:

10.1177/2158244016682292
URLs:

http://urn.fi/URN:NBN:fi:tty-201612214895
Research output: Contribution to journal › Article › Scientific › peer-review

Influence of atmospheric plasma treatment on surface properties and inkjet printability of plastic packaging film

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Lahti, J., Eiroma, K., Tenhunen, T., Pykönen, M., Toivakka, M.
Number of pages: 7
Pages: 1-7
Publication date: 2010

Host publication information
Title of host publication: Iarigai 2010 Montreal, Advances in Printing and Media Technology, Montreal, Canada, September 12-15, 2010

Bibliographical note
Contribution: organisation=epr pap,FACT1=1
Source: researchoutputwizard
Source ID: 8548
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Influence of Diffusion Barriers on Thermal Ageing Behaviour of Solar Absorber Coatings on Copper
The thermal stability of magnetron sputtered and electroplated solar absorber coatings were investigated at elevated temperatures of 200-500°C. Diffusion barriers of aluminium and nickel were studied towards thermal diffusion of copper substrate atoms.

The diffusion barriers studied were experimental magnetron sputtered Al layers and an industrial electroplated Ni layer between a Cu substrate and an absorber coating. The thicknesses of Al barriers were 0.1 µm and 0.5 µm, and a Ni barrier was 3 µm thick. As absorber coatings, magnetron sputtered chromium-based coatings and industrially electroplated black chromium coatings, were studied. The sputtered absorbers were a 3-layer stack of CrOx/Cr/CrOx with layer thicknesses of 0.05/0.03/0.05 µm, respectively. The electroplated black chromium coating had a thickness of 0.2 µm. Copper was used as a substrate for all of the absorbers studied.

The degradation of the absorber surfaces and influence of diffusion barriers were analysed by optical measurements (solar absorptance with a UV/Vis/NIR spectrophotometer and thermal emittance with a FTIR spectrophotometer), microstructural analyses were performed using a field-emission scanning electron microscope (FESEM). The absorbers were aged by means of heat treatments in a circulating air furnace at 200, 300, 400 and 500°C for two hours. The experimental analyses were performed before and after the ageing studies.

The results showed that without a barrier coating copper substrate atoms can diffuse into the absorber coating and through the coating to the surface of the coating and form CuO islands on the surface. These phenomena degraded optical selectivity of the absorber surface. The diffusion can be prevented or retarded with a diffusion barrier layer between the Cu substrate and the absorber coating. The 3-µm-thick Ni barrier prevented Cu diffusion and retained optical selectivity up to 500°C for two hours and the 0.5-µm-thick Al layer up to 400°C.

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Materials Science, Research group: Surface Engineering
Contributors: Kotilainen, M., Vuoristo, P.
Number of pages: 11
Pages: 481-491
Publication date: 2015

Host publication information
Title of host publication: Surface Modification Technologies XXVIII : Tampere University of Technology Tampere, Finland June 16-18, 2014
ISBN (Print): 978-81-926196-1-3
Keywords: Thermal ageing, Thin films, Absorber coating, Aluminium barrier, Copper substrate, Diffusion barrier, Magnetron sputtering, Stability
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Influence of temperature and pretreatments on the anaerobic digestion of wastewater grown microalgae in a laboratory-scale accumulating-volume reactor

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Urban circular bioeconomy (UrCirBio)
Contributors: Kinnunen, V., Craggs, R., Rintala, J.
Number of pages: 11
Pages: 247-257
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Water Research
Volume: 57
Ratings:
Scopus rating (2014): CiteScore 9.7 SJR 2.946 SNIP 2.688
Original language: English
DOIs:
10.1016/j.watres.2014.03.043

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-05-06
Publisher name: I W A Publishing; Water Quality Association
Source: researchoutputwizard
Source ID: 726
Research output: Contribution to journal › Article › Scientific › peer-review

Influence of TiO_2 compact layer precursor on the performance of perovskite solar cells

The optimization of the hole-blocking layer in perovskite solar cells (PSC), typically based on TiO_2, is crucial, as it strongly affects the device performance. In this work, we thoroughly characterize the thickness, roughness, and crystal structure of a set of TiO_2 compact layers produced by spin coating of different precursor sols and correlate the choice of the TiO_2 precursor to the photovoltaic performance of the PSC. By replacing the commonly used titanium isopropoxide (TTIP) blocking layer precursor with titanium tetrachloride ($TiCl_4$), a clear enhancement in the PSC performance was observed, particularly in the hysteresis behavior and stability. The results from the morphological/structural analysis and transient photoluminescence studies clarify the different behavior of the compact layers in PSCs.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed

Organisations: Department of Chemistry and Bioengineering, Research group: Supramolecular photochemistry, Åbo Akademi, Aalto University, VTT
Contributors: Vivo, P., Ojanperä, A., Smått, J., Sánden, S., Hashmi, S. G., Kaunisto, K., Ihalainen, P., Masood, M. T., Österbacka, R., Lund, P. D., Lemmetyinen, H.
Pages: 287-293
Publication date: 2017
Peer-reviewed: Yes
Early online date: 17 Nov 2016

Publication information
Journal: Organic Electronics
Volume: 41
ISSN (Print): 1566-1199
Ratings:

Scopus rating (2017): CiteScore 6 SJR 1.085 SNIP 0.884
Original language: English
DOIs:

10.1016/j.orgel.2016.11.017

Bibliographical note
EXT="Kaunisto, Kimmo"
Research output: Contribution to journal › Article › Scientific › peer-review

Inhibitory effects of substrate and soluble end products on biohydrogen production of the alkalithermophile Caloramator celer: Kinetic, metabolic and transcription analyses
In this study the tolerance of the alkalithermophile Caloramator celer towards substrate (glucose) and soluble end product (acetate, formate and ethanol) inhibition was assessed employing nonlinear inhibition models. In addition, the effects of subinhibitory concentrations of end products on fermentative metabolism and regulation of 12 key genes involved in pyruvate catabolism were studied. Optimal growth and H_2 production were found at 50 mM of glucose and the critical substrate concentration was observed at 290-360 mM. Two inhibition models revealed that ethanol had a higher inhibitory effect on growth rate, whereas H_2 production kinetics was more sensitive towards increasing concentrations of acetate and formate. Acetate, the main soluble metabolite of the fermentation, inhibited the H_2 production by increasing the ionic strength in the medium. Subinhibitory concentrations of soluble end products induced changes in the metabolite profile of C. celer, specifically exogenous acetate (80 mM) and ethanol (40 mM) slightly increased the H_2 yield by 4 and 7%, respectively. However, despite the observed metabolic shifts, gene regulation was minimal and not always in agreement with the measured product yields. Overall, the results suggest that further optimization of the H_2 production process from C. celer should focus on methods to evolve adapted osmotolerant strains and/or remove soluble metabolites, especially acetate, from the culture.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Urban circular bioeconomy (UrCirBio)
Contributors: Ciranna, A., Ferrari, R., Santala, V., Karp, M.
Number of pages: 11
Pages: 6391-6401
Publication date: 15 Apr 2014
Peer-reviewed: Yes

Publication information
Journal: International Journal of Hydrogen Energy
Volume: 39
Issue number: 12
ISSN (Print): 0360-3199
Ratings:

Scopus rating (2014): CiteScore 5.6 SJR 1.207 SNIP 1.488
Original language: English
ASJC Scopus subject areas: Renewable Energy, Sustainability and the Environment, Fuel Technology, Condensed Matter Physics, Energy Engineering and Power Technology
Keywords: Acetate, Dark fermentation, End product inhibition, Gene expression, Kinetic model, Substrate inhibition
DOIs:

10.1016/j.ijhydene.2014.02.047

URLs:

http://www.scopus.com/inward/record.url?scp=84897389272&partnerID=8YFLogxK (Link to publication in Scopus)

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-04-29
Publisher name: Elsevier Ltd; International Association for Hydrogen Energy
Source: researchoutputwizard
Source ID: 235
Research output: Contribution to journal › Article › Scientific › peer-review

Innovative use of recovered municipal solid waste incineration bottom ash as a component in growing media

The utilisation of municipal solid waste incineration bottom ash has been extensively studied, for example, in the unbound layers of roads and the products of cement and concrete industry. On the other hand, less attention has been given to other innovative utilisation possibilities, such as using the municipal solid waste incineration bottom ash as a component in growing media of plants. The municipal solid waste incineration bottom ash contains useful substances, such as calcium, that can influence plant growth in a positive manner. Therefore, the utilisation of this waste-derived material in the growing media may substitute the use of commercial fertilisers. Since the municipal solid waste incineration bottom ash also contains hazardous substances that can be toxic to plants, the main aim of this study was to add different amounts of recovered municipal solid waste incineration bottom ash in the growing media and to evaluate the effect of this material on plant growth. Based on the obtained results, the concentration of, for example copper and zinc, increased in test plants; ryegrass and barley, when recovered municipal solid waste incineration bottom ash was added in their growing media. On the other hand, this did not have a significant effect on plant growth, if compared with the growth of plants in commercially produced growing medium. Furthermore, the replacement of natural sand with municipal solid waste incineration bottom ash had a positive liming effect in the growing media. Overall, these findings suggest that the utilisation of recovered municipal solid waste incineration bottom ash as a component in growing media is possible and, thus, may allow more widespread and innovative use of this waste-derived material.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Suomen Erityisjäte Oy
Contributors: Sormunen, A., Kanniainen, T., Salo, T., Rantsi, R.
Pages: 595-604
Publication date: 1 Jul 2016
Peer-reviewed: Yes

Publication information
Journal: Waste Management and Research
Volume: 34
Issue number: 7
ISSN (Print): 0734-242X
Ratings:

Scopus rating (2016): CiteScore 2.8 SJR 0.673 SNIP 1.081
Original language: English
DOIs:

10.1177/0734242X16650748
Research output: Contribution to journal › Article › Scientific › peer-review

Insentiivit julkisen sektorin innovaatiotoiminnan edistämisen välineinä. Esimerkkinä Georgian osavaltion palvelu-uudistus

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Anttiroiko, A., Heino, O.
Number of pages: 8
Pages: 298-305
Publication date: 2012
Peer-reviewed: Yes

Publication information
Journal: Työelämän tutkimus
Volume: 10
Issue number: 3

ISSN (Print): 0788-091X
Original language: Finnish

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-07-29
Source: researchoutputwizard
Source ID: 3857
Research output: Contribution to journal › Article › Scientific › peer-review

Institutional development is the key for sustainable water services in the built environment

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering
Contributors: Katko, T. S., Hukka, J. J.
Number of pages: 12
Pages: 419-430
Publication date: 2016

Host publication information
Title of host publication: Proceedings of the CIB World Building Congress 2016 : Volume IV - Understanding impacts and functioning of different solutions
Place of publication: Tampere
Publisher: Tampere University of Technology. Department of Civil Engineering
Editors: Nenonen, S., Junnonen, J.
ISBN (Print): 978-952-15-3744-8
URLs:

https://tutcris.tut.fi/portal/files/6186967/WBC16_Vol_4.pdf
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Integration of water and wastewater utilities

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Former organisation of the author
Contributors: Katko, T. S., Kurki, V. O., Juuti, P. S., Rajala, R. P., Seppälä, O. T.
Pages: 62-70
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Journal American Water Works Association
Volume: 102
Issue number: 9
ISSN (Print): 0003-150X
Ratings:

Scopus rating (2010): SJR 0.429 SNIP 0.773
Original language: English

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 8314
Research output: Contribution to journal › Article › Scientific › peer-review

Integration of water and wastewater utilities

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, Former organisation of the author
Contributors: Katko, T. S., Kurki, V. O., Juuti, P. S., Rajala, R. P., Seppälä, O. T.

Number of pages: 12
Pages: 29-40
Publication date: 2013

Host publication information
Title of host publication: Water Services Management and Governance : Lessons for a Sustainable Future
Publisher: IWA Publishing
Editors: Katko, T. S., Juuti, P. S., Schwartz, K., Rajala, R. P.
ISBN (Print): 978-1-78040-022-8
ISBN (Electronic): 978-1-78040-073-0

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-09-29
Source: researchoutputwizard
Source ID: 2524
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Introduction: Evolution and futures of water management: strategic decisions, challenges and effectiveness

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, Former organisation of the author
Contributors: Juuti, P. S., Katko, T. S., Rajala, R. P.
Pages: 6-20
Publication date: 2008

Host publication information
Title of host publication: Water: a Matter of Life - Long-term strategic thinking in water services. 193 p. KehräMedia Inc
Editors: Juuti P.S., K. T. S., Rajala, R.

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 12417
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Inverse infrastructures: self-organization in the water services

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Heino, O., Anttiroiko, A.
Number of pages: 17
Pages: 299-315
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Water Policy
ISSN (Print): 1366-7017
Ratings:
Scopus rating (2014): CiteScore 1.8 SJR 0.46 SNIP 0.771
Original language: English
DOIs:
10.2166/wp.2014.095
URLs:
http://www.iwaponline.com/wp/up/wp2014095.htm

Bibliographical note
siirretään 2015 : Water Policy In Press, Uncorrected Proof © IWA Publishing 2014
doi:10.2166/wp.2014.095
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2015-01-15
Source: researchoutputwizard

Source ID: 439
Research output: Contribution to journal › Article › Scientific › peer-review

Ja alussa oli vesi

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Civil Engineering, University of Tampere
Contributors: Juuti, P., Rajala, R.
Pages: 15-18
Publication date: 2011

Host publication information
Title of host publication: Vinttikaivosta vesiyhtiöön
Place of publication: Saarijärvi
Publisher: TamPub
Editors: Juuti, P., Rajala, R.
ISBN (Print): 978-952-92-8428-3
ISBN (Electronic): 978-951-44-8409-4
URLs:
http://urn.fi/urn:isbn:978-951-44-8409-4
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Jätehuollon jakautuminen osamarkkinoihin ja yritystoiminta

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering
Contributors: Kallio, O., Valkama, P., Siitonen, P., Heino, O.
Number of pages: 15
Pages: 99-113
Publication date: 2013

Host publication information
Title of host publication: Markkinainnovaatiot yhdyskuntajätehuollossa : tutkimus jätehuoltopalvelujen markkinoiden evoluutiosta, sovelluksista ja jännitteistä kunnallisen ja yksityisen sektorin rajapinnassa
Place of publication: Tampere
Publisher: Tampereen yliopisto, Johtamiskorkeakoulu
Editor: Valkama, P.
ISBN (Print): 978-951-44-9163-4
ISBN (Electronic): 978-951-44-9164-1
URLs:
http://www.uta.fi/jkk/yhteystiedot/hallintotiede/valkama/projects/subprojects/VALKAMA3kirjapainojune2013.pdf

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-07-29
Source: researchoutputwizard
Source ID: 2475
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Jätehuollon, -politiikan ja -lainsäädännön institutionaalinen kuvaus

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering
Contributors: Heino, O., Kallio, O., Valkama, P., Siitonen, P.
Number of pages: 18
Pages: 33-50
Publication date: 2013

Host publication information

Title of host publication: Markkinainnovaatiot yhdyskuntajätehuollossa : tutkimus jätehuoltopalvelujen markkinoiden evoluutiosta, sovelluksista ja jännitteistä kunnallisen ja yksityisen sektorin rajapinnassa
Place of publication: Tampere
Publisher: Tampereen yliopisto, Johtamiskorkeakoulu
Editor: Valkama, P.
ISBN (Print): 978-951-44-9163-4
ISBN (Electronic): 978-951-44-9164-1
URLs:

http://www.uta.fi/jkk/yhteystiedot/hallintotiede/valkama/projects/subprojects/VALKAMA3kirjapainojune2013.pdf

Bibliographical note

Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-07-29
Source: researchoutputwizard
Source ID: 2273
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Jätehuollon tekniset vaihtoehdot

General information

Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering
Contributors: Heino, O.
Number of pages: 24
Pages: 51-74
Publication date: 2013

Host publication information

Title of host publication: Markkinainnovaatiot yhdyskuntajätehuollossa : tutkimus jätehuoltopalvelujen markkinoiden evoluutiosta, sovelluksista ja jännitteistä kunnallisen ja yksityisen sektorin rajapinnassa
Place of publication: Tampere
Publisher: Tampereen yliopisto, Johtamiskorkeakoulu
Editor: Valkama, P.
ISBN (Print): 978-951-44-9163-4
ISBN (Electronic): 978-951-44-9164-1
URLs:

http://www.uta.fi/jkk/yhteystiedot/hallintotiede/valkama/projects/subprojects/VALKAMA3kirjapainojune2013.pdf

Bibliographical note

Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-07-29
Source: researchoutputwizard
Source ID: 2269
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Jätevedenpuhdistuksen ja viemäröinnin vaiheita Helsingissä

General information

Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Civil Engineering, University of Tampere
Contributors: Juuti, P., Rajala, R.
Pages: 36-90
Publication date: 2010

Host publication information

Title of host publication: Metropoli ja meri - 100 vuotta jätevedenpuhdistusta Helsingissä
Publisher: TamPub
Editors: Juuti, P., Rajala, R., Katko, T.
URLs:

http://urn.fi/urn:isbn:978-952-6604-09-1
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Johdanto: vesirikas Riihimäki

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Research group: Industrial Bioengineering and Applied Organic Chemistry, Department of Civil Engineering, University of Tampere
Contributors: Juuti, P., Pietilä, P., Rajala, R.
Pages: 26-33
Publication date: 2010

Host publication information
Title of host publication: Hyvän veden ja hyvien yhteyksien kaupunki : Riihimäen Veden historia
Publisher: TamPub
Editors: Juuti, P., Rajala, R., Pietilä, P., Katko, T.
ISBN (Print): 978-952-5571-29-5
ISBN (Electronic): 978-951-44-8136-9
URLs:
http://urn.fi/urn:isbn:978-951-44-8136-9
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Johtoja ja joukkuehenkeä

General information
Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Department of Chemistry and Bioengineering
Contributors: Heino, O.
Number of pages: 3
Pages: 11-13
Publication date: 2013
Peer-reviewed: Unknown

Publication information
Journal: Vesitalous
Issue number: 3
ISSN (Print): 0505-3838
Original language: Finnish
URLs:
http://www.vesitalous.fi

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-07-29
Source: researchoutputwizard
Source ID: 2270
Research output: Contribution to journal › Article › Professional

Joukkoliikenteellä on tärkeä rooli liikenteen päästöjen vähentämisessä

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Civil Engineering, Research group: Transport Research Centre Verne, Suomen ympäristökeskus SYKE - Finnish Environment Institute
Contributors: Mäkinen, J., Mela, H.
Number of pages: 4
Publication date: 28 Nov 2019

Publication information
Place of publication: Helsinki
Publisher: Suomen ympäristökeskus (SYKE)
ISBN (Electronic): 978-952-11-5114-9
Original language: Finnish
Electronic versions:

Canemure-BestPractices_Joukkoliikenne_28-11-2019
URLs:
http://www.hiilineutraalisuomi.fi/download/noname/%7BC3B35663-2258-464D-B5BB-7A9ACA201C25%7D/151880
http://urn.fi/URN:NBN:fi:tuni-202001311730
Research output: Book/Report › Commissioned report › Professional

Käänteiset infrastruktuurit ja integroiva infrastruktuuripolitiikka

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Anttiroiko, A., Heino, O.
Number of pages: 14
Pages: 30-43
Publication date: 2013
Peer-reviewed: Yes

Publication information
Journal: Yhdyskuntasuunnittelu
Volume: 51
Issue number: 3
ISSN (Print): 1459-6806
Original language: Finnish

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-12-30
Publisher name: Yhdyskuntasuunnittelun Seura
Source: researchoutputwizard
Source ID: 1932
Research output: Contribution to journal › Article › Scientific › peer-review

Käänteiset perusrakenteet : Suuntana hajautettu infrastruktuuripolitiikka?

General information
Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Former organisation of the author
Contributors: Heino, O., Anttiroiko, A.
Number of pages: 3
Pages: 40-42
Publication date: 2013
Peer-reviewed: Unknown

Publication information
Journal: Kuntatekniikka
Issue number: 1
ISSN (Print): 1238-125X
Original language: Finnish
URLs:
http://lehti.kuntatekniikka.fi/sites/default/files/KT0113-PDF-WWW-HQ.pdf

Bibliographical note
Affiliaatiossa ei mainintaa TTY:stä
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-07-29
Source: researchoutputwizard
Source ID: 2272
Research output: Contribution to journal › Article › Professional

Kaivoista ja käymälöistä kohti kunnallista vesihuoltoa

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book

Organisations: University of Tampere
Contributors: Juuti, P.
Pages: 34-63
Publication date: 2010

Host publication information
Title of host publication: Hyvän veden ja hyvien yhteyksien kaupunki : Riihimäen Veden historia
Publisher: TamPub
Editors: Juuti, P., Rajala, R., Pietilä, P., Katko, T.
ISBN (Print): 978-952-5571-29-5
ISBN (Electronic): 978-951-44-8136-9
URLs:

http://urn.fi/urn:isbn:978-951-44-8136-9
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Kapkaupungin pysyvä vesikriisi – ratkeaako vesipula, jos lisää vettä pumpataan vuotavaan verkostoon

General information
Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Research group: Capacity Development of Water and Environmental Services CADWES, Civil Engineering
Contributors: Juuti, P., Rajala, R.
Number of pages: 4
Pages: 39-42
Publication date: 2018
Peer-reviewed: Unknown

Publication information
Journal: Vesitalous
Issue number: 5
ISSN (Print): 0505-3838
Original language: Finnish
Research output: Contribution to journal › Article › Professional

Kasvun ja veden kausi – I vesilaitoksesta II maailmansotaan

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Civil Engineering, University of Tampere
Contributors: Juuti, P., Rajala, R.
Pages: 51-74
Publication date: 2011

Host publication information
Title of host publication: Vinttikaivosta vesiyhtiöön
Place of publication: Saarijärvi
Publisher: TamPub
Editors: Juuti, P., Rajala, R.
ISBN (Print): 978-952-92-8428-3
ISBN (Electronic): 978-951-44-8409-4
URLs:

http://urn.fi/urn:isbn:978-951-44-8409-4
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Kinetics of biomass pyrolysis

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Energy and Process Engineering
Contributors: Kokko, L., Tolvanen, H., Hankalin, V., Raiko, R.
Pages: 39-45
Publication date: 2010

Host publication information
Title of host publication: BioRefine Yearbook 2010. Tekes Rewiew
Editors: Mäkinen, T., Alakangas, E., Kauppi, M.
ISBN (Print): 978-952-457-511-9

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 8410
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Kirja-arviointi: Kuinka vesiensuojelu saatiin pääosin kuntoon?

General information
Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Civil Engineering
Contributors: Katko, T. S.
Number of pages: 2
Pages: 46-47
Publication date: 2017
Peer-reviewed: No

Publication information
Journal: Vesitalous
Volume: 58
Issue number: 4
ISSN (Print): 0505-3838
Original language: Finnish
Research output: Contribution to journal › Article › Scientific

Kirja-arviointi:Yliopistomme vaarassa hukkua byrokratiaan. Pekka Kauppi. Kahlittu yliopistomme. Miten vapaudumme byrokratiasta ja opetuksen ylenkatsomisesta. Into Kustannus Oy. 2017.

General information
Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Civil Engineering
Contributors: Katko, T. S.
Number of pages: 3
Pages: 58-60
Publication date: Jun 2018
Peer-reviewed: No

Publication information
Journal: Tiedepolitiikka
Volume: 43
Issue number: 1
ISSN (Print): 0782-0674
Original language: Finnish
URLs:

http://www.tiedeliitto.net/tiedepolitiikka_lehti/tp1_18.htm
Research output: Contribution to journal › Article › Scientific

Kirjastolta uutta tiedonhankinnan opetusta tukemaan opetusta antavien yksiköiden toimintaa

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Library, Department of Energy and Process Engineering
Contributors: Lepistö, K., Korpinen, L.
Pages: 136-138
Publication date: 2010

Host publication information
Title of host publication: ReflekTori 2010 Tekniikan opetuksen symposium 9.-10.2010, Espoo. Dipoli-raportit B
Editor: Myller, E.
ISBN (Print): 978-952-60-3477-5

Bibliographical note
Contribution: organisation=epr,FACT1=1
Contribution: organisation=kir,FACT2=0
Source: researchoutputwizard
Source ID: 8616
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Kohti hajautettua infrastruktuuripolitiikkaa? Paikalliset vesiosuuskunnat perusrakenteiden tuottajina

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, University of Tampere
Contributors: Heino, O., Anttiroiko, A.
Number of pages: 13
Pages: 38-50
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Maaseudun uusi aika
Volume: 22
Issue number: 3
ISSN (Print): 1237-413X
Original language: Finnish
Research output: Contribution to journal › Article › Scientific › peer-review

Kohti puhtaampaa Itämerta

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Civil Engineering, University of Tampere
Contributors: Juuti, P., Rajala, R.
Pages: 135-142
Publication date: 2010

Host publication information
Title of host publication: Metropoli ja meri - 100 vuotta jätevedenpuhdistusta Helsingissä
Publisher: TamPub
Editors: Juuti, P., Rajala, R., Katko, T.
URLs:
http://urn.fi/urn:isbn:978-952-6604-09-1
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Kohti tasapuolisempaa tutkimuksen arviointia: Pääkirjoitus

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering
Contributors: Katko, T. S.
Number of pages: 2
Pages: 4-5
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Ympäristöhistoria: Finnish Journal of Environmental History
Volume: 5

Issue number: 1
ISSN (Print): 1799-6953
Original language: Finnish
URLs:
http://www.uta.fi/yky/tutkimus/historia/projektit/iehg/Ymparistohistoria/No1_2015.html
Research output: Contribution to journal › Article › Scientific › peer-review

Kokeellinen tutkimus savupiipun läpivientieristeen orgaanisen aineen palamisen vaikutuksesta paloturvallisuuteen

General information
Publication status: Published
MoE publication type: D3 Professional conference proceedings
Organisations: Civil Engineering, Research group: Responsible Construction
Contributors: Leppänen, P., Malaska, M.
Number of pages: 6
Pages: 15-20
Publication date: 29 Aug 2017

Host publication information
Title of host publication: Pelastustieto : Palotutkimuksen päivät 2017, erikoisnumero
Publisher: Palo- ja pelastustieto ry

Publication series
Name: Pelastustieto
ISSN (Print): 0031-0476
URLs:
https://issuu.com/pelastustieto/docs/ptp_2017_36e7f91f6c7cf2
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Professional

Kokemus: Kajaanin vesihuollon ammattilaisten kokemukset ja näkemykset

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, University of Tampere
Contributors: Juuti, P., Rajala, R., Katko, T. S.
Pages: 175-228
Publication date: 2009

Host publication information
Title of host publication: Elämän virta : Kajaanin veden historia
Publisher: TamPub
Editors: Juuti, P., Rajala, R., Katko, T.
ISBN (Print): 978-951-800-320-8
ISBN (Electronic): 978-951-44-7657-0
URLs:
http://urn.fi/urn:isbn:978-951-44-7657-0
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Konvergenssi ja divergenssi ongelmatyyppien luonnehtijoina: Esimerkkinä vesihuoltoinfrastruktuurin ikääntyminen

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Heino, O.
Number of pages: 8
Pages: 39-46
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Tiedepolitiikka
Volume: 40

Issue number: 3
ISSN (Print): 0782-0674
Original language: Finnish
Research output: Contribution to journal › Article › Scientific › peer-review

Koulutus ja tutkimus kehityksen moottorina

General information
Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Civil Engineering, Research group: Capacity Development of Water and Environmental Services CADWES
Contributors: Hukka, J., Katko, T. S., Pietilä, P.
Number of pages: 1
Pages: 13
Publication date: Dec 2019
Peer-reviewed: Unknown

Publication information
Journal: Econetin asakaslehti AQ
Issue number: 3
ISSN (Print): 1799-7763
Original language: Finnish
URLs:
http://digimag.econetgroup.fi/digimag/3-19-suomi/qfi0319_12-jpg
Research output: Contribution to journal › Article › Professional

Kuka päättää vesihuollon tulevaisuudesta? (Who decides on the future of the water supply?)

General information
Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Department of Chemistry and Bioengineering, Department of Civil Engineering, Former organisation of the author
Contributors: Rajala, R., Juuti, P., Katko, T.
Number of pages: 2
Pages: 33-34
Publication date: 2014
Peer-reviewed: No

Publication information
Journal: Vesitalous
Volume: 51
Issue number: 1
ISSN (Print): 0505-3838
Original language: Finnish
URLs:
http://www.vesitalous.fi/wp-content/uploads/2013/05/1_2010.pdf

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-09-16
Publisher name: Maa- Ja Vesitekniikan Tuki
Source: researchoutputwizard
Source ID: 1334
Research output: Contribution to journal › Article › Scientific

KUPERA-kaupunkien teknisen sektorin johto kaipaa toimintakulttuuriin muutosta : Haasteista innovatiivisiin mahdollisuuksiin

General information
Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Former organisation of the author
Contributors: Leponiemi, U., Heino, O.
Pages: 51-52

Publication date: 2011
Peer-reviewed: Unknown

Publication information
Journal: Kuntatekniikka
Issue number: 7
ISSN (Print): 1238-125X
Original language: Finnish

Bibliographical note
Affiliaatio: Johtamiskorkeakoulu, Tampereen Yliopisto
Contribution: organisation=keb,FACT1=1
Source: researchoutputwizard
Source ID: 6593
Research output: Contribution to journal › Article › Professional

Kyläyhteisöt palvelukulutuksen alustana

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Department of Chemistry and Bioengineering
Contributors: Laukka, A., Heino, O., Valkama, P., Salonen, A.
Number of pages: 16
Publication date: 2013

Publication information
Place of publication: Tampere
Publisher: Maaseutupolitiikan yhteistyöryhmä, YTR
ISBN (Print): 978-952-227-782-4
Original language: Finnish

Publication series
Name: Maaseutupolitiikan yhteistyöryhmän julkaisuja
Publisher: Maaseutupolitiikan yhteistyöryhmä, YTR
No.: 6
ISSN (Print): 1238-6464

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-12-12
Source: researchoutputwizard
Source ID: 2732
Research output: Book/Report › Commissioned report › Professional

Kylien palvelutuotantoedellytyksistä erityisesti julkisten palvelujen näkökulmasta tarkasteltuna

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Department of Chemistry and Bioengineering
Contributors: Valkama, P., Heino, O., Salonen, A., Laukka, A.
Number of pages: 9
Publication date: 2013

Publication information
Place of publication: Tampere
Publisher: Maaseutupolitiikan yhteistyöryhmä, YTR
ISBN (Print): 978-952-227-782-4
ISBN (Electronic): 978-952-227-783-1
Original language: Finnish

Publication series
Name: Maaseutupolitiikan yhteistyöryhmän julkaisuja
Publisher: Maaseutupolitiikan yhteistyöryhmä, YTR
No.: 6
ISSN (Print): 1238-6464

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-12-12
Source: researchoutputwizard
Source ID: 3635
Research output: Book/Report › Commissioned report › Professional

Laajentumisen aika

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Civil Engineering, University of Tampere
Contributors: Juuti, P., Rajala, R.
Pages: 75-118
Publication date: 2011

Host publication information
Title of host publication: Vinttikaivosta vesiyhtiöön
Place of publication: Saarijärvi
Publisher: TamPub
Editors: Juuti, P., Rajala, R.
ISBN (Print): 978-952-92-8428-3
ISBN (Electronic): 978-951-44-8409-4
URLs:
http://urn.fi/urn:isbn:978-951-44-8409-4
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Lack of water engineers hampering development. North-South cooperation in higher education is a must

General information
Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Department of Chemistry and Bioengineering
Contributors: Hukka, J. J., Katko, T. S., Pietilä, P. P.
Pages: 58-61
Publication date: 2011
Peer-reviewed: Unknown

Publication information
Journal: Rakennustekniikka
Volume: 66
Issue number: 2
ISSN (Print): 0033-913X
Original language: English

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 6114
Research output: Contribution to journal › Article › Professional

Lähde: Pohjavedenottamot

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, Department of Chemistry and Bioengineering, University of Tampere
Contributors: Juuti, P., Rajala, R., Katko, T. S.
Pages: 93-136
Publication date: 2009

Host publication information
Title of host publication: Elämän virta : Kajaanin veden historia

Publisher: TamPub
Editors: Juuti, P., Rajala, R., Katko, T.
ISBN (Print): 978-951-800-320-8
ISBN (Electronic): 978-951-44-7657-0
URLs:
http://urn.fi/urn:isbn:978-951-44-7657-0
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Lähteet Suomen vesihuollossa

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Former organisation of the author
Contributors: Katko, T., Juuti, P. S.
Number of pages: 4
Pages: 15-18
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Vesitalous
Issue number: 4
ISSN (Print): 0505-3838
Original language: Finnish

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-10-07
Source: researchoutputwizard
Source ID: 677
Research output: Contribution to journal › Article › Scientific › peer-review

Landowners' willingness to promote bioenergy production on wasteland − future impact on land use of cutaway peatlands
Landowners are the key players in bioenergy production on wasteland; such as cutaway peatlands. In this study, the landowner's interest to use cutaway peatlands for bioenergy production was investigated using a survey and GIS (Geographic Information Systems) methods in an area in South Ostrobothnia, Finland. The focus was to identify which different bioenergy production chains are preferred by the respondents: combustion, gasification or biogas production from agriculture, energy-willow short-rotation forestry or forestry based energy crops. Also, the influence of personal environmental values on the selection was measured and the future impacts and barriers for the land use were assessed. Afforestation was the most popular after-use method among the landowners. The next most favorable method was energy crop cultivation but it was highly dependent on economic profitability and subsidies. Currently, approximately 8.2% or 500 ha of the total peat extraction area could be used for bioenergy production in the region by 2035. Based on the survey, forest based biomass is the best option if bioenergy is to be produced. The next choice was agro biomass and the least favored plant was willow. This study suggests that the biggest cutaway peatlands will be converted to forest energy in the future. Suggestive results were that the owners with high environmental values are especially interested in agro biomass growing and the landowner having a distant home place does not have a negative influence on bioenergy production. Altogether, land use and biomass production of cutaway peatlands is connected with the demands of the Finnish bio-economy.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Chemistry and Bioengineering, Research group: Bio- and Circular Economy, Jyväskylän yliopisto, Seinäjoki University of Applied Sciences
Contributors: Laasasenaho, K., Lensu, A., Rintala, J., Lauhanen, R.
Number of pages: 9
Pages: 167-175
Publication date: 1 Dec 2017
Peer-reviewed: Yes

Publication information
Journal: Land Use Policy
Volume: 69
ISSN (Print): 0264-8377
Ratings:

Scopus rating (2017): CiteScore 5.1 SJR 1.348 SNIP 1.76
Original language: English
ASJC Scopus subject areas: Forestry, Geography, Planning and Development, Nature and Landscape Conservation, Management, Monitoring, Policy and Law
Keywords: Biogas, Combustion, Energy crop, Gasification, GIS, Willow
Electronic versions:

laasasenaho_landowners_willingness_to_promote. Embargo ended: 19/09/20
DOIs:

10.1016/j.landusepol.2017.09.010
URLs:

http://urn.fi/URN:NBN:fi:tuni-201910033675. Embargo ended: 19/09/20
Source: Scopus
Source ID: 85029532718
Research output: Contribution to journal › Article › Scientific › peer-review

Learning for sustainable water and sanitation services

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Chemistry and Bioengineering
Contributors: Takala, A.
Pages: 250-258
Publication date: 2016

Host publication information
Title of host publication: Proceedings of the 8th International Conference on Engineering Education for Sustainable Development (Bruges, 4-7 September 2016) : Building a circular economy together
Place of publication: Brugge
Publisher: Instituut vóór Duu rzame Ontwikkeling vzw
Editor: Mazijn, B.
Article number: D.3.2
ISBN (Electronic): 978-90-903-0131-0
URLs:

http://instituutvoorduurzameontwikkeling.be/fileadmin/user_upload/eesd2016_proceedings.pdf
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Leveraging concepts for environmentally sustainable business management in construction - a focused review
The main objective of this paper is to advance applied conceptual knowledge about environmentally sustainable business management (BM) in construction. Environmentally sustainable BM is herein defined to encompass the utilization and development of natural resources in ways which are compatible with the maintenance of these resources, and with the conservation of the natural and built environments, for current and future generations. In principle, concept designers can incorporate environmental sustainability into their BM concepts as a dimension, an element, or an attribute of managing, or as a criterion in decision making. Readily, the 71 construction-related BM concepts have been published between 1990 and 2013. A focused review resulted in the expected findings, i.e., only the 11 (15%) construction-related BM concepts have been designed along the environmental sustainability dimension. Thus, it is posited that high-sustainability BM concepts be designed by coupling environmental sustainability with the three other necessary dimensions, i.e., content-free frames of reference on BM, schools of thought on generic BM, and focal contexts in construction, respectively. In turn, CIB-related researchers may adopt these couplings and engage themselves with cross-disciplinary BM conceptualization programs in collaboration with farsighted business managers in construction.

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering, Research group: Digitalization in the real estate and construction sector
Contributors: Huovinen, P.
Number of pages: 11
Pages: 286-296
Publication date: 2015

Host publication information
Title of host publication: CIB Proceedings 2015 : Going North for Sustainability: Leveraging Knowledge and Innovation for Sustainable Construction and Development
Place of publication: London, UK

Publisher: IBEA Publications Ltd
Editor: Egbu , C.
ISBN (Print): 978-1-326-47951-0
ASJC Scopus subject areas: Building and Construction
Keywords: business management, concept design, construction, environmental sustainability, research review
Electronic versions:

CIB 2015 Huovinen Pekka Leveraging environmentally sustainable BM concepts 121115
URLs:

http://urn.fi/URN:NBN:fi:tty-201701101042
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Liikenteen päästötavoitteiden saavuttaminen 2030 - politiikkatoimenpiteiden tarkastelu

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Civil Engineering
Contributors: Liimatainen, H., Viri, R.
Publication date: 30 May 2017

Publication information
Publisher: Suomen ilmastopaneeli
Original language: Finnish
URLs:

http://www.ilmastopaneeli.fi/uploads/selvitykset_lausunnot/Ilmastopaneeli_Liikenne_2017.pdf
Research output: Book/Report › Commissioned report › Professional

Liite 6: Yleistä kaivannaisjätealueista ja patoturvallisuudesta

General information
Publication status: Published
MoE publication type: D2 Article in professional manuals or guides or professional information systems or text book material
Organisations: Department of Civil Engineering, Research group: Earth Constructions
Contributors: Leppänen, M., Välisalo, T. (ed.), Laasonen, J.
Publication date: 2014

Host publication information
Title of host publication: Kaivosten stressitesti 2013
Publisher: Ympäristöministeriö
ISBN (Electronic): 978-952-11-4269-7

Publication series
Name: Ympäristöministeriön raportteja
URLs:

http://www.ym.fi/fi-FI/Ajankohtaista/Julkaisut/YMra_22014_Kaivosten_stressitestit_2013%2828221%29
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Professional

Long-term measurement of free time exposure to low frequency magnetic fields in Finland

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Holm, A., Korpinen, L.
Number of pages: 2
Pages: 1-2
Publication date: 2010

Host publication information
Title of host publication: Bioelectromagnetics Society 32nd Annual Meeting (BEMS), June 14-18, 2010, Seoul, Korea
URLs:

http://www.bioelectromagnetics.org/bems2010/

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 8089
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Long-term performance evaluation of an anoxic sulfur oxidizing moving bed biofilm reactor under nitrate limited conditions
An anoxic sulfur-oxidizing moving bed biofilm reactor (MBBR) treating sulfur and nitrate-contaminated synthetic wastewater was monitored for 306 days under feed nitrogen-to-sulfur (N/S) molar ratios of 0.5, 0.3 and 0.1. Thiosulfate ($S_2O_3^{2-}$) removal efficiencies (RE) exceeding 98% were observed at a N/S ratio of 0.5 and a $S_2O_3^{2-}$ loading rate of 0.9 g $S_2O_3^{2-}$–S L^{-1} d^{-1}, whereas a RE of 82.3 (±2.6)% and 37.7 (±3.4)% were observed at N/S ratios of 0.3 and 0.1, respectively. Complete nitrate (NO_3^-) removal was obtained at all tested N/S ratios. A comparison of the kinetic parameters of the MBBR biomass under the same stoichiometric conditions (N/S ratio of 0.5) revealed a 1.3-fold increase of the maximum specific rate of $S_2O_3^{2-}$ oxidation (rmax) and a 30-fold increase of the affinity constant for $S_2O_3^{2-}$ (Ks) compared to those observed after long-term NO_3^- limitation (N/S ratio of 0.1). The MBBR showed optimal resilience to NO_3^- limitation as the $S_2O_3^{2-}$ RE recovered from 37.3% to 94.1% within two days after increasing the N/S ratio from 0.1 to 0.5. Based on PCR-DGGE analysis, sulfur-oxidizing nitrate-reducing bacteria, i.e. Thiobacillus sp. and Sulfuritalea sp., dominated in the MBBR biofilm during the entire study.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Research group: Bio- and Circular Economy, Materials Science and Environmental Engineering, Department of Civil and Mechanical Engineering, University of Cassino and Southern Lazio, ENEA/CREATE/Università Degli Studi Napoli Federico II, Wageningen University and the UNESCO-IHE Institute for Water Education, Delft, The Netherlands, 18.10.2013, Hydraulic and Environmental Engineering (IHE) Inst. for Water Education
Contributors: Khanongnuch, R., Di Capua, F., Lakaniemi, A., Rene, E. R., Lens, P.
Pages: 1072-1081
Publication date: 29 Apr 2019
Peer-reviewed: Yes

Publication information
Journal: Environmental Science: Water Research & Technology
Volume: 5
Issue number: 6
ISSN (Print): 2053-1400
Ratings:

Scopus rating (2019): CiteScore 5.5 SJR 1.058 SNIP 1.094
Original language: English
Electronic versions:

c9ew00220k
DOIs:

10.1039/C9EW00220K
URLs:

http://urn.fi/URN:NBN:fi:tty-201905171646
Research output: Contribution to journal › Article › Scientific › peer-review

Long term stability of air processed inkjet infiltrated carbon-based printed perovskite solar cells under intense ultra-violet light soaking
The long term stability of air processed inkjet infiltrated carbon based perovskite solar cells (CPSCs) is investigated under intense ultra-violet light soaking equivalent to 1.5 Sun UV light illumination. Two batches of the fabricated CPSCs were exposed systematically i.e. first without implementing any protective coating and then epoxying the CPSCs through a low cost commonly available epoxy which was applied to serve as a barrier against moisture and humidity intrusion. The CPSCs with no protective layer against moisture and humidity exhibited impressive preliminary stability for hundreds of hours during their exposure to intense UV light and provided great motivation to test the CPSCs further with more optimization. As a result, the CPSCs having commonly available epoxy as a protective barrier exhibited remarkable durability and showed no performance degradation for a period of 1002 hours under intense and continuous 1.5 Sun equivalent UV light illumination proving that the technology is clearly not inherently unstable and that future developments might lead to market breakthroughs.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Chemistry and Bioengineering, Research group: Supramolecular photochemistry, Aalto University, Solaronix, Ecole Polytechnique Fédérale de Lausanne

Contributors: Hashmi, S. G., Tiihonen, A., Martineau, D., Özkan, M., Vivo, P., Kaunisto, K., Vainio, U., Zakeeruddin, S. M. , Grätzel, M.
Pages: 4797-4802
Publication date: 2017
Peer-reviewed: Yes
Early online date: 10 Feb 2017

Publication information
Journal: Journal of Materials Chemistry A
Volume: 5
Issue number: 10
ISSN (Print): 2050-7488
Ratings:

Scopus rating (2017): CiteScore 16 SJR 3.488 SNIP 1.544
Original language: English
DOIs:

10.1039/C6TA10605F

Bibliographical note
EXT="Kaunisto, Kimmo"
Research output: Contribution to journal › Article › Scientific › peer-review

Long-term strategic decisions in 13 countries and 29 cities

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P. S., Katko, T. S.
Pages: 50-72
Publication date: 2005

Host publication information
Title of host publication: Water, Time and European Cities. History matters for the Futures
Place of publication: Tampere
Publisher: Tampere University Press
Editors: Juuti, P. S., Katko, T. S.
ISBN (Print): 951-44-6337-4
URLs:

http://urn.fi/urn:isbn:951-44-6337-4

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 18530
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Long-term thermophilic mono-digestion of rendering wastes and co-digestion with potato pulp

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Urban circular bioeconomy (UrCirBio)
Contributors: Bayr, S., Ojanperä, M., Kaparaju, P., Rintala, J.
Number of pages: 7
Pages: 1853-1859
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Waste Management
Volume: 34
Issue number: 10
ISSN (Print): 0956-053X

Ratings:

Scopus rating (2014): CiteScore 5.9 SJR 1.763 SNIP 2.499
Original language: English
DOIs:

10.1016/j.wasman.2014.06.005

Bibliographical note

Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-09-30
Publisher name: Pergamon
Source: researchoutputwizard
Source ID: 157
Research output: Contribution to journal › Article › Scientific › peer-review

Loppuluku – haasteita riittää tulevaisuuteen

General information

Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: University of Tampere
Contributors: Juuti, P. S., Rajala, R.
Pages: 131-144
Publication date: 2009

Host publication information

Title of host publication: Vesihuoltoyhteistyötä yli rajojen : PK-seudun yhteistyöhankkeet ja yhdistämissuunnitelmat ennen ja nyt Espoon näkökulmasta
Publisher: University of Tampere
Editors: Juuti, P., Rajala, R.
ISBN (Print): 978-951-857-559-0
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Low concentration of zeolite to enhance microalgal growth and ammonium removal efficiency in a membrane photobioreactor

The aim of this work was to study the growth and nutrient removal efficiency of a mixed microalgal culture with and without the addition of low concentrations (0.5, 1, and 5 g L^{-1} of total liquid volume in the reactor) of natural zeolite. A control test in which only zeolite was added into a similar membrane photobioreactor was also conducted. The addition of 0.5 g L^{-1} zeolite to a continuously-fed membrane photobioreactor increased the microalgal biomass concentration from 0.50 to 0.90–1.17 g particulate organic carbon per L while the average ammonium removal efficiency increased from 14% to 30%. Upon microscopic inspection, microalgal cells were observed growing on the surface of zeolite particles, which indicates that zeolite can support attached microalgal growth. With higher zeolite doses (1 and 5 g L^{-1}) inside the reactor, however, the breaking apart of added zeolite particles into finer particles dramatically increased solution turbidity, which likely was not beneficial for microalgal growth and ammonium removal due to reduced light penetration. This work shows that low doses of zeolite can be used as microcarriers to enhance microalgal biomass concentration and ammonium removal efficiency, while minimizing zeolite dose would likely reduce the turbidity effects.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Research group: Bio- and Circular Economy, Materials Science and Environmental Engineering, University of South Florida Tampa, UNESCO-IHE Institute for Water Education, Delft, Institut de Physique du Globe de Paris
Contributors: Tao, R., Bair, R., Pickett, M., Calabria, J. L., Lakaniemi, A., van Hullebusch, E. D., Rintala, J. A., Yeh, D. H.
Number of pages: 15
Publication date: 2020
Peer-reviewed: Yes

Publication information

Journal: Environmental Technology
ISSN (Print): 0959-3330
Original language: English
ASJC Scopus subject areas: Environmental Chemistry, Water Science and Technology, Waste Management and Disposal
Keywords: membrane photobioreactor, Microalgal growth, nutrient removal, turbidity, wastewater treatment
DOIs:

10.1080/09593330.2020.1752813
Source: Scopus

Source ID: 85084252299
Research output: Contribution to journal › Article › Scientific › peer-review

L´oxydation chimique pour la remediation des sols contamines par des composes recalcitrants. Cas de la chlordecone

General information
Publication status: Published
MoE publication type: D3 Professional conference proceedings
Organisations: Department of Chemistry and Bioengineering
Contributors: Tuhkanen, T.
Pages: 8-11
Publication date: 2011

Host publication information
Title of host publication: Remediation a la pollution par la chlordecone aux Antilles, No 9-10, Avril 2011
Publisher: Le Lamentin

Publication series
Name: Les Cahiers du PRAM
ISSN (Print): 1638-3974

Bibliographical note
Chapter in a book + oral presentation
Contribution: organisation=keb bio,FACT1=1
Publisher name: Le Lamentin
Source: researchoutputwizard
Source ID: 7404
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Professional

Luminescent bacteria-based sensing method for methylmercury specific determination

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Urban circular bioeconomy (UrCirBio)
Contributors: Rantala, A., Utriainen, M., Kaushik, N., Virta, M., Välimaa, A., Karp, M.
Pages: 1041-1049
Publication date: 2011
Peer-reviewed: Yes

Publication information
Journal: Analytical and Bioanalytical Chemistry
Volume: 400
Issue number: 4
ISSN (Print): 1618-2642
Ratings:

Scopus rating (2011): CiteScore 5.4 SJR 1.37 SNIP 1.277
Original language: English
DOIs:

10.1007/s00216-011-4866-x

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 7088
Research output: Contribution to journal › Article › Scientific › peer-review

Lyhyestä tiede kaunis?

General information
Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Department of Chemistry and Bioengineering
Contributors: Katko, T.
Pages: 55-55
Publication date: 2011

Peer-reviewed: No

Publication information
Journal: Tiedepolitiikka
Volume: 36
Issue number: 2
ISSN (Print): 0782-0674
Original language: Finnish

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 6326
Research output: Contribution to journal › Article › Scientific

Managed aquifer recharge in community water supply: the Finnish experience and some international comparisons

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Life Cycle Effectiveness of the Built Environment (LCE@BE)
Contributors: Kurki, V., Lipponen, A., Katko, T.
Number of pages: 16
Pages: 774-789
Publication date: 2013
Peer-reviewed: Yes

Publication information
Journal: Water International
Volume: 38
Issue number: 6
ISSN (Print): 0250-8060
Ratings:
Scopus rating (2013): CiteScore 1.7 SJR 0.503 SNIP 0.565
Original language: English
DOIs:
10.1080/02508060.2013.843374

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-11-29
Publisher name: Routledge
Source: researchoutputwizard
Source ID: 2661
Research output: Contribution to journal › Article › Scientific › peer-review

Managing water and sewerage services in a cold, four-seasons climate

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Bio- ja ympäristötekniikka
Contributors: Hukka, J., Katko, T., Pietilä, P., Vinnari, E.
Pages: 17-18
Publication date: 2007

Host publication information
Title of host publication: Proceedings of the 8th ISCORD Symposium, Tampere, Finland, September 25-27, 2007

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14364
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Managing water supply through joint regional municipal authorities in Finland: Two comparative cases

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Stenroos, M., Katko, T. S.
Pages: 667-681
Publication date: 2011
Peer-reviewed: Yes

Publication information
Journal: Water
Volume: 3
Issue number: 2
ISSN (Print): 2073-4441
Ratings:

Scopus rating (2011): CiteScore 2.1 SNIP 0.851
Original language: English
DOIs:

10.3390/w3020667

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 7305
Research output: Contribution to journal › Article › Scientific › peer-review

Measurers' Exposure to Extremely Low Frequency Magnetic Fields at 400 kV Substations

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L., Kuisti, H., Tarao, H., Pääkkönen, R.
Pages: 282-285
Publication date: 2012

Host publication information
Title of host publication: PIERS 2012 Moscow Proceedings, August 19-23, 2012, Moscow, Russia
Publisher: Electromagnetics Academy
ISBN (Print): 978-1-934142-22-6

Publication series
Name: Progress in Electromagnetics Research Symposium
ISSN (Print): 1559-9450
ISSN (Electronic): 1559-9450
URLs:

http://www.piers.org

Bibliographical note
ei ut-numeroa 19.8.2013
Contribution: organisation=epr,FACT1=1
Publisher name: Electromagnetics Academy
Source: researchoutputwizard
Source ID: 4533
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Measures for Energy Efficient and Low Emission Private Mobility

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Civil Engineering, Research group: Transport Research Centre Verne
Contributors: Liimatainen, H.
Publication date: 2020

Host publication information
Title of host publication: Affordable and Clean Energy. Encyclopedia of the UN Sustainable Development Goals.
Publisher: Springer
ISBN (Electronic): 978-3-319-71057-0

Publication series
Name: Encyclopedia of the UN Sustainable Development Goals
ISSN (Electronic): 2523-7403
DOIs:

10.1007/978-3-319-71057-0_57-1
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Mechanical properties of recovered municipal solid waste incineration bottom ash: the influence of aging and changes in moisture content
The scarcity of non-renewable natural resources and the demand for waste recycling and utilization are steering towards increasing use of waste-derived materials in civil engineering structures. However, as the quality of different waste-derived materials can vary depending on input materials and processes in which they are generated, the utilization of these materials in civil engineering may be risky and cumbersome unless their properties are well-known. In Finland, due to the recently increased number of waste incineration plants, nearly 300 000 t of municipal solid waste incineration bottom ash (MSWI BA) is generated annually in the country. As the material is mainly landfilled or used in landfill site structures at the moment, the utilization of MSWI BA in different civil engineering applications could be increased, if the essential properties of the material were properly understood. In this study, the mechanical properties of recovered MSWI BA were investigated with cyclic load and static triaxial tests.. The study focused especially on the influence of changes in moisture content and its relation to the development of recovered MSWI BA stiffness and strength properties over time. The obtained results showed that the stiffness of recovered MSWI BA was highly affected by the changes in moisture content over time but also the material aging had an influence. The resilient modulus, Mr, was at least doubled during the two months storage of test specimens. Furthermore, when the MSWI BA material dried out and the moisture content decreased 5-7 %, the resilient modulus, Mr, of the material was even quadrupled.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Research area: Infrastructure Construction, Research group: Earth Constructions
Contributors: Sormunen, L. A., Kolisoja, P.
Pages: 252-270
Publication date: 2018
Peer-reviewed: Yes
Early online date: 13 Nov 2016

Publication information
Journal: Road Materials and Pavement Design
Volume: 19
Issue number: 2
ISSN (Print): 1468-0629
Ratings:

Scopus rating (2018): CiteScore 3.3 SJR 0.963 SNIP 1.344
Original language: English
DOIs:

10.1080/14680629.2016.1251960
Research output: Contribution to journal › Article › Scientific › peer-review

Mental symptoms and the use of new technical equipment

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L., Pääkkönen, R.
Pages: 385-400
Publication date: 2009
Peer-reviewed: Yes

Publication information

Journal: International Journal of Occupational Safety and Ergonomics
Volume: 15
Issue number: 4
ISSN (Print): 1080-3548
Ratings:
Scopus rating (2009): SJR 0.284 SNIP 0.688
Original language: English
URLs:
http://www.ciop.pl/jose

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 10519
Research output: Contribution to journal › Article › Scientific › peer-review

Merkittävimmät päästövähennystoimet ilmastonmuutoksen hillitsemiseksi

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Civil Engineering, Research group: Transport Research Centre Verne, Suomen ympäristökeskus SYKE - Finnish Environment Institute, Luonnonvarakeskus, Finnish Environment Institute
Contributors: Auvinen, K., Maanavilja, L., Seppälä, J., Sankelo, P., Mäkinen, J., Sarkkola, S., Helonheimo, T., Saikku, L., Lounasheimo, J., Riekkinen, V.
Number of pages: 4
Publication date: 15 May 2020

Publication information
Publisher: Suomen ympäristökeskus (SYKE)
ISBN (Electronic): 978-952-11-5164-4
Original language: Finnish
URLs:
https://issuu.com/suomenymparistokeskus/docs/canemure-bestpractices_paastovahennystoimet?fr=sYzFmYTE0MDE4OTQ
Research output: Book/Report › Commissioned report › Professional

Metabolic engineering of Acinetobacter baylyi ADP1 for improved growth on gluconate and glucose
A high growth rate in bacterial cultures is usually achieved by optimizing growth conditions, but metabolism of the bacterium limits the maximal growth rate attainable on the carbon source used. This limitation can be circumvented by engineering the metabolism of the bacterium. Acinetobacter baylyi has become a model organism for studies of bacterial metabolism and metabolic engineering due to its wide substrate spectrum and easy-to-engineer genome. It produces naturally storage lipids, such as wax esters, and has a unique gluconate catabolism as it lacks a gene for pyruvate kinase. We engineered the central metabolism of A. baylyi ADP1 more favorable for gluconate catabolism by expressing the pyruvate kinase gene (pykF) of Escherichia coli. This modification increased growth rate when cultivated on gluconate or glucose as a sole carbon source in a batch cultivation. The engineered cells reached stationary phase on these carbon sources approximately twice as fast as control cells carrying an empty plasmid and produced similar amount of biomass. Furthermore, when grown on either gluconate or glucose, pykF expression did not lead to significant accumulation of overflow metabolites and consumption of the substrate remained unaltered. Increased growth rate on glucose was not accompanied with decreased wax ester production, and the pykF-expressing cells accumulated significantly more of these storage lipids with respect to cultivation time.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Tampere University of Technology, Urban circular bioeconomy (UrCirBio)
Contributors: Kannisto, M., Aho, T., Karp, M., Santala, V.
Number of pages: 7
Pages: 7021-7027
Publication date: 2014
Peer-reviewed: Yes

Publication information

Journal: Applied and Environmental Microbiology
Volume: 80
Issue number: 22
ISSN (Print): 0099-2240
Ratings:

Scopus rating (2014): CiteScore 7.4 SJR 1.872 SNIP 1.394
Original language: English
ASJC Scopus subject areas: Applied Microbiology and Biotechnology, Food Science, Biotechnology, Ecology, Medicine(all)
DOIs:

10.1128/AEM.01837-14
URLs:

http://www.scopus.com/inward/record.url?scp=84908263110&partnerID=8YFLogxK (Link to publication in Scopus)

Bibliographical note

Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-11-20
Publisher name: American Society for Microbiology
Source: researchoutputwizard
Source ID: 650
Research output: Contribution to journal › Article › Scientific › peer-review

Metals removal and recovery in bioelectrochemical systems: A review

Metal laden wastes and contamination pose a threat to ecosystem well being and human health. Metal containing waste streams are also a valuable resource for recovery of precious and scarce elements. Although biological methods are inexpensive and effective for treating metal wastewaters and in situ bioremediation of metal(loid) contamination, little progress has been made towards metal(loid) recovery. Bioelectrochemical systems are emerging as a new technology platform for removal and recovery of metal ions from metallurgical wastes, process streams and wastewaters. Biodegradation of organic matter by electroactive biofilms at the anode has been successfully coupled to cathodic reduction of metal ions. Until now, leaching of Co(II) from LiCoO<inf>2</inf> particles, and removal of metal ions i.e. Co(III/II), Cr(VI), Cu(II), Hg(II), Ag(I), Se(IV), and Cd(II) from aqueous solutions has been demonstrated. This article reviews the state of art research of bioelectrochemical systems for removal and recovery of metal(loid) ions and pertaining removal mechanisms.

General information

Publication status: Published
MoE publication type: A2 Review article in a scientific journal
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Urban circular bioeconomy (UrCirBio), CSIR-Indian Institute of Chemical Technology, Bhabha Atomic Research Centre
Contributors: Nancharaiah, Y. V., Venkata Mohan, S., Lens, P.
Number of pages: 13
Pages: 102-114
Publication date: 2015
Peer-reviewed: Yes
Early online date: 17 Jun 2015

Publication information

Journal: Bioresource Technology
Volume: 195
ISSN (Print): 0960-8524
Ratings:

Scopus rating (2015): CiteScore 9.2 SJR 2.243 SNIP 1.899
Original language: English
ASJC Scopus subject areas: Bioengineering, Environmental Engineering, Waste Management and Disposal
Keywords: Bioelectrochemical treatment (BET), Biorecovery, Heavy metals, Microbial fuel cells, Wastewater treatment
DOIs:

10.1016/j.biortech.2015.06.058
URLs:

http://www.scopus.com/inward/record.url?scp=84931864864&partnerID=8YFLogxK (Link to publication in Scopus)
Source: Scopus
Source ID: 84945442633
Research output: Contribution to journal › Review Article › Scientific › peer-review

Metering the quality of water supply and sewage network maintenance services

General information
Publication status: Published
MoE publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Chemistry and Bioengineering
Contributors: Välisalo, T., Heino, O., Luomanen, T.
Number of pages: 9
Pages: 1-9
Publication date: 2012

Host publication information
Title of host publication: 2012 IFME World Congress on Municipal Engineering. Sustainable Communities, June 4-10, Helsinki, Finland
Publisher: International Federation of Municipal Engineering IFME
ISBN (Print): 978-951-758-541-5

Publication series
Name: International Federation of Municipal Engineering World Congress
ISSN (Print): 0356-9403

Bibliographical note
ei ut-numeroa 21.9.2013
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-07-29
Publisher name: International Federation of Municipal Engineering IFME
Source: researchoutputwizard
Source ID: 5492
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific

Methane oxidation potential of boreal landfill cover materials: The governing factors and enhancement by nutrient manipulation
Methanotrophs inhabiting landfill covers are in a crucial role in mitigating CH_4 emissions, but the characteristics of the cover material or ambient temperature do not always enable the maximal CH_4 oxidation potential (MOP). This study aimed at identifying the factors governing MOPs of different materials used for constructing biocovers and other cover structures. We also tested whether the activity of methanotrophs could be enhanced at cold temperature (4 and 12 °C) by improving the nutrient content (NO_3^-, PO_4^{3-}, trace elements) of the cover material. Compost samples from biocovers designed to support CH_4 oxidation were exhibiting the highest MOPs (4.16 μmol CH_4 g_{dw}^{-1} h^{-1}), but also the soil samples collected from other cover structures were oxidising CH_4 (0.41 μmol CH_4 g_{dw}^{-1} h^{-1}). The best predictors for the MOPs were the NO_3^- content and activity of heterotrophic bacteria at 72.8 %, which were higher in the compost samples than in the soil samples. The depletion of NO_3^- from the landfill cover material limiting the activity of methanotrophs could not be confirmed by the nutrient manipulation assay at 4 °C as the addition of nitrogen decreased the MOPs from 0.090 μmol CH_4 g_{dw}^{-1} h^{-1} to < 0.085 μmol CH_4 g_{dw}^{-1} h^{-1}. At 12 °C, all nutrient additions reduced the MOPs. The inhibition was believed to result from high ionic concentration caused by nutrient addition. At 4 °C, the addition of trace elements increased the MOPs (> 0.096 μmol CH_4 g_{dw}^{-1} h^{-1}) suggesting that this was attributable to stimulation of the enzymatic activity of the psychrotolerant methanotrophs.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Urban circular bioeconomy (UrCirBio)
Contributors: Maanoja, S. T., Rintala, J. A.
Number of pages: 9
Pages: 399-407
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Waste Management
Volume: 46
ISSN (Print): 0956-053X
Ratings:

Scopus rating (2015): CiteScore 6.3 SJR 1.732 SNIP 2.268
Original language: English
Keywords: Greenhouse gases, Landfill, Cover material, Methane oxidation, Nutrients
DOIs:

10.1016/j.wasman.2015.08.011

Research output: Contribution to journal › Article › Scientific › peer-review

Methylophaga and Hyphomicrobium can be used as target genera in monitoring saline water methanol-utilizing denitrification

Which bacterial taxonomic groups can be used in monitoring saline water methanol-utilizing denitrification and whether nitrate is transformed into N2 in the process are unclear. Therefore, methylotrophic bacterial communities of two efficiently functioning (nitrate/nitrite reduction was 63–96 %) tropical and cool seawater reactors at a public aquarium were investigated with clone library analysis and 454 pyrosequencing of the 16S rRNA genes. Transformation of nitrate into N2 was confirmed using 15N labeling in incubation of carrier material from the tropical reactor. Combining the data with previous study results, Methylophaga and Hyphomicrobium were determined to be suitable target genera for monitoring the function of saline water methanol-fed denitrification systems. However, monitoring was not possible at the single species level. Interestingly, potential nitrate-reducing methylotrophs within Filomicrobium and closely related Fil I and Fil II clusters were detected in the reactors suggesting that they also contributed to methylotrophic denitrification in the saline environment.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Univ Helsinki, University of Helsinki, Dept Environm Sci, Univ Jyvaskyla, University of Jyvaskyla, Dept Biol & Environm Sci, Nanosci Ctr
Contributors: Rissanen, A. J., Ojala, A., Dernjatin, M., Jaakkola, J., Tiirola, M.
Pages: 1-11
Publication date: 1 Oct 2016
Peer-reviewed: Yes

Publication information

Journal: Journal of Industrial Microbiology and Biotechnology
ISSN (Print): 1367-5435
Ratings:

Scopus rating (2016): CiteScore 5.1 SJR 0.958 SNIP 0.94
Original language: English
Electronic versions:

Rissanen_et_al_JIMB_AQUAR. Embargo ended: 1/10/17
DOIs:

10.1007/s10295-016-1839-2
URLs:

http://urn.fi/URN:NBN:fi:tty-201611284816 . Embargo ended: 1/10/17
Research output: Contribution to journal › Article › Scientific › peer-review

Methylophilaceae and Hyphomicrobium as target taxonomic groups in monitoring the function of methanol-fed denitrification biofilters in municipal wastewater treatment plants

Molecular monitoring of bacterial communities can explain and predict the stability of bioprocesses in varying physicochemical conditions. To study methanol-fed denitrification biofilters of municipal wastewater treatment plants, bacterial communities of two full-scale biofilters were compared through fingerprinting and sequencing of the 16S rRNA genes. Additionally, 16S rRNA gene fingerprinting was used for 10-week temporal monitoring of the bacterial community in one of the biofilters. Combining the data with previous study results, the family Methylophilaceae and genus Hyphomicrobium were determined as suitable target groups for monitoring. An increase in the relative abundance of Hyphomicrobium-related biomarkers occurred simultaneously with increases in water flow, NO x(-) load, and methanol addition, as well as a higher denitrification rate, although the dominating biomarkers linked to Methylophilaceae showed an opposite pattern. The results indicate that during increased loading, stability of the bioprocess is maintained by selection of more efficient denitrifier populations, and this progress can be analyzed using simple molecular fingerprinting.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, University of Jyväskylä
Contributors: Rissanen, A. J., Ojala, A., Fred, T., Toivonen, J., Tiirola, M.
Pages: 1-13
Publication date: 8 Nov 2016
Peer-reviewed: Yes

Publication information

Journal: Journal of Industrial Microbiology and Biotechnology
ISSN (Print): 1367-5435
Ratings:

Scopus rating (2016): CiteScore 5.1 SJR 0.958 SNIP 0.94
Original language: English
Electronic versions:

Rissanen_etal_JIMB_WWTP. Embargo ended: 8/11/17
DOIs:

10.1007/s10295-016-1860-5
URLs:

http://urn.fi/URN:NBN:fi:tty-201611254803 . Embargo ended: 8/11/17
Source: PubMed
Source ID: 27826724
Research output: Contribution to journal › Article › Scientific › peer-review

Metropoli ja meri. 100 vuotta jätevedenpuhdistusta Helsingissä

General information
Publication status: Published
MoE publication type: C1 Separate scientific books
Organisations: Department of Chemistry and Bioengineering, Department of Civil Engineering, Former organisation of the author
Contributors: Juuti, P., Rajala, R., Katko, T.
Number of pages: 158
Publication date: 2010

Publication information
Place of publication: Helsinki
Publisher: HSY Helsingin seudun ympäristöpalvelut
ISBN (Print): 978-952-6604-09-1
Original language: Finnish

Publication series
Name: HSY:n julkaisuja
Publisher: HSY Helsingin seudun ympäristöpalvelut
Volume: 6/2010
Electronic versions:

juuti_metropoli_ja_meri.pdf
URLs:

http://urn.fi/URN:NBN:fi:tty-2011041513515

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 8243
Research output: Book/Report › Book › Scientific › peer-review

Microalgae grow on source separated human urine in Nordic climate: Outdoor pilot-scale cultivation
Human urine contributes approximately 80% of nitrogen and 50% of phosphorous in urban wastewaters while having a volume of only 1–1.5L/d per capita compared to 150–200L/d per capita of wastewater generated. There is interest to study source separation of urine and search methods to recover the nutrients form the urine. In this study, the objective was to use the nutrients in source separated urine for outdoor cultivation of microalgae in Nordic climate. A freshwater green microalga Scenedesmus acuminatus was grown in different dilutions (1:20 and 1:15) of source separated human urine, in a semi-continuously operated outdoor raceway pond with a liquid volume of 2000 L, at hydraulic retention time of 15d. The microalgae could remove 52% nitrogen and 38% phosphorus even at culture temperatures as low as 5°C, while obtaining a biomass density of 0.34g VSS/L. Harvested microalgal biomass could be used to produce methane with a yield of 285L CH_4/kg volatile solids.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Research group: Bio- and Circular Economy, Materials Science and Environmental Engineering
Contributors: Chatterjee, P., Granatier, M., Ramasamy, P., Kokko, M., Lakaniemi, A., Rintala, J.
Number of pages: 9

Pages: 119 - 127
Publication date: 2019
Peer-reviewed: Yes

Publication information
Journal: Journal of Environmental Management
Volume: 237
ISSN (Print): 0301-4797
Ratings:

Scopus rating (2019): CiteScore 7.6 SJR 1.321 SNIP 1.839
Original language: English
Keywords: Microalgae, Nutrient recovery, Raceway pond, Source separated human urine
DOIs:

10.1016/j.jenvman.2019.02.074

Bibliographical note
INT=msee,"Granatier, Marianna"
Source: Bibtex
Source ID: CHATTERJEE2019119
Research output: Contribution to journal › Article › Scientific › peer-review

Microbial electrochemical technologies with the perspective of harnessing bioenergy: Maneuvering towards upscaling
Microbial electrochemical technologies have gained much attention in the recent years during which basic research has been carried out to provide proof of concept by utilizing microorganisms for generating bioenergy in an electro redox active environment. However, these bio-electrocatalyzed systems pose significant challenges towards up-scaling and practical applications. Various parameters viz., electrodes, materials, configuration, biocatalyst, reaction kinetics, fabrication and operational costs, resistance for electron transfer etc. will critically govern the performance of microbial catalyzed electrochemical systems. Majorly, the surface area of electrode materials, biofilm coverage on the electrode surface, enrichment of electrochemically active electrode respiring bacteria and reduction reactions at cathode will aid in increasing the reaction kinetics towards the upscaling of microbial electrochemical technologies. Enrichment of electroactive microbial community on anode electrode can be promoted with electrode pretreatment, controlled anode potential or electrical current, external resistance, optimal operation temperature, chemical additions and bioaugmentation. Inhibition of the growth of methanogens also increases the columbic efficiency, an essential parameter that determines the efficacy of bioelectricity generation. Considering the practical implementation of these microbial electrochemical technologies, the current review addresses the challenges and strategies to improve the performance of bio-electrocatalyzed systems with respect to the operational, physico-chemical and biological factors towards scale up. Besides, the feasibility for long term operation, the scope for future research along with the operational and maintenance costs are discussed to provide a broad spectrum on the role of the system components for the implementation of these bio-electrochemical technologies for practical utility.

General information
Publication status: Published
MoE publication type: A2 Review article in a scientific journal
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, CSIR-Indian Institute of Chemical Technology, Indian Institute of Technology, Delhi, India, Department of Environmental Engineering, Yildiz Technical University, Department of Chemical Engineering, Bioengineering and Environmental Sciences (BEES), CSIR-Indian Institute of Chemical Technology (CSIR-IICT), Sustainable Environergy Research Laboratory (SERL), Indian Institute of Technology Delhi
Contributors: Butti, S. K., Velvizhi, G., Sulonen, M. L. K., Haavisto, J. M., Oguz Koroglu, E., Yusuf Cetinkaya, A., Singh, S. , Arya, D., Annie Modestra, J., Vamsi Krishna, K., Verma, A., Ozkaya, B., Lakaniemi, A., Puhakka, J. A., Venkata Mohan, S.
Pages: 462-476
Publication date: Jan 2016
Peer-reviewed: Yes

Publication information
Journal: Renewable and Sustainable Energy Reviews
Volume: 53
ISSN (Print): 1364-0321
Ratings:

Scopus rating (2016): CiteScore 12.9 SJR 2.998 SNIP 3.543
Original language: English
ASJC Scopus subject areas: Renewable Energy, Sustainability and the Environment
Keywords: Biocatalyst, Bioelectrochemical system, Electrode materials, Fuel celldesign, Microbial fuelcell
DOIs:

10.1016/j.rser.2015.08.058
Source: Scopus
Source ID: 84942275042
Research output: Contribution to journal › Review Article › Scientific › peer-review

Microstructure-property relationships of novel ultra-high strength press hardening steels

The industrial significance of microalloyed martensitic steels manufactured via cold rolling, reaustenitization, and quenching has been typically recognized as low. However, it is currently believed that microalloying can improve the in-service properties of ultra-high-strength press hardening steels. In this work, five 34MnB5-based steels were designed to address the role of Ti and V when combined with Cr or Mo. Microstructure-property relationships were analyzed after die quenching and additional bake hardening (BH) heat treatment using advanced methods of microscopy, glow discharge optical emission spectroscopy, quasi-static tensile tests, and three-point bending tests. Results indicate that both Ti and V can provide grain size refinement through the formation of stabile nanosized precipitates. The BH treatment improved postuniform elongation values, indicating a trend of improved ductility. However, the expected improvements in bendability were clearly confirmed only for two V-microalloyed steels with the alloying concepts of 0.3Cr-0.15V-0.03Al-0.02Ti-0.0020B and 0.3Mo-0.15V-0.0060N (without Al-Ti-B additions) (wt pct). Thus, it was discovered that microalloying with V, when combined with either Cr or Mo, provides a promising combination of mechanical properties as far as the austenitization parameters are appropriately controlled.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Materials Science, Research group: Metals Technology, Research group: Materials Characterization, SSAB Europe Oy
Contributors: Järvinen, H., Honkanen, M., Oja, O., Järvenpää, M., Peura, P.
Number of pages: 21
Pages: 816-836
Publication date: 2019
Peer-reviewed: Yes
Early online date: 29 Nov 2018

Publication information
Journal: Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science
Volume: 50
Issue number: 2
ISSN (Print): 1073-5623
Ratings:

Scopus rating (2019): CiteScore 3.9 SJR 0.906 SNIP 1.22
Original language: English
ASJC Scopus subject areas: Condensed Matter Physics, Mechanics of Materials, Metals and Alloys
Keywords: Press hardening, Bake hardening, Martensite, EBSD, TEM, Mechanical behavior
Electronic versions:

Microstructure-property_relationships_2018. Embargo ended: 29/11/19
DOIs:

10.1007/s11661-018-4967-7
URLs:

http://urn.fi/URN:NBN:fi:tuni-201912307139. Embargo ended: 29/11/19
Research output: Contribution to journal › Article › Scientific › peer-review

Mihin jätevedenpuhdistusta tarvitaan?

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Civil Engineering, University of Tampere
Contributors: Juuti, P., Rajala, R.
Pages: 13-35
Publication date: 2010

Host publication information
Title of host publication: Metropoli ja meri - 100 vuotta jätevedenpuhdistusta Helsingissä
Publisher: TamPub
Editors: Juuti, P., Rajala, R., Katko, T.
URLs:

http://urn.fi/urn:isbn:978-952-6604-09-1
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Mine wastewater treatment using Phalaris arundinacea plant material hydrolyzate as substrate for sulfate-reducing bioreactor

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Lakaniemi, A., Nevatalo, L. M., Kaksonen, A. H., Puhakka, J. A.
Pages: 3931-3939
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Bioresource Technology
Volume: 101
Issue number: 11
ISSN (Print): 0960-8524
Ratings:

Scopus rating (2010): SJR 2.089 SNIP 2.348
Original language: English
DOIs:

10.1016/j.biortech.2010.01.020

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 8565
Research output: Contribution to journal › Article › Scientific › peer-review

Ministry of the Environment announces a Guide on Renovation and Repair of Buildings with Moisture and Microbial Damage - From theory to practice
In 2015, the Ministry of the Environment in Finland renewed the legislation and the National Building Code of Finland. It released completely new legislation concerning repair design. This was due to widely known issues relating to the indoor air quality of private and public buildings. In the autumn of 2019, the Ministry of the Environment in Finland published a guide concerning the repairs of moisture and microbial damage. It is available in Finnish and Swedish. This guide is a follow-up of the Environmental Guide "Building Moisture and Indoor Air Quality Assessment", published 2016. It completes the series of guides for the execution of a project repairing indoor air quality issues, from a condition assessment to the completion of repairs and the implementation of the building. These guides lead through common practices and how these issues shall be dealt with in Finland.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Civil Engineering, Research group: Service Life Engineering of Structures, Ramboll Finland Ltd., Aalto University
Contributors: Weijo, I., Turunen, T., Lahdensivu, J., Sistonen, E., Annila, P.
Number of pages: 6
Publication date: 30 Jun 2020
Peer-reviewed: Yes

Publication information
Journal: E3S Web of Conferences
Volume: 172
Article number: 20007
ISSN (Print): 2555-0403
Original language: English
ASJC Scopus subject areas: Environmental Science(all), Energy(all), Earth and Planetary Sciences(all)
Electronic versions:

e3sconf_nsb2020_20007
DOIs:

10.1051/e3sconf/202017220007

URLs:
http://urn.fi/URN:NBN:fi:tuni-202008266672

Bibliographical note
EXT="Weijo, Inari"
Source: Scopus
Source ID: 85088468858
Research output: Contribution to journal › Conference article › Scientific › peer-review

Missä, missä se kaivo on?

General information
Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Department of Chemistry and Bioengineering
Contributors: Katko, T.
Pages: s. 8
Publication date: 2009
Peer-reviewed: Unknown

Publication information
Journal: Vesimittari, HS-Veden asiakaslehti
Issue number: 1
Original language: English

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 10373
Research output: Contribution to journal › Article › Professional

Modeling fine particles and alkali metal compound behavior in a kraft recovery boiler

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering, Research group: Power Plant and Combustion Technology, Urban circular bioeconomy (UrCirBio), Valmet Technologies Oy
Contributors: Leppänen, A., Välimäki, E., Oksanen, A.
Number of pages: 6
Pages: 9-14
Publication date: 2012
Peer-reviewed: Yes

Publication information
Journal: TAPPI Journal
Volume: 11
Issue number: 7
ISSN (Print): 0734-1415
Ratings:
Scopus rating (2012): SJR 0.331 SNIP 0.741
Original language: English
URLs:
http://www.tappi.org/Bookstore/Technical-Papers/Journal-Articles/TAPPI-JOURNAL/Archives/2012/July/Table-of-Contents/MOdeling-fine-particles-and-alkali-metal-compound-behavior-i.aspx

Bibliographical note
Contribution: organisation=epr,FACT1=1
Publisher name: TAPPI
Source: researchoutputwizard
Source ID: 4694
Research output: Contribution to journal › Article › Scientific › peer-review

Modeling of autonomous power systems - A mathematical model of a hybrid power system

General information
Publication status: Published
MoE publication type: B3 Non-refereed article in conference proceedings
Organisations: Energia- ja prosessitekniikka
Contributors: Mustonen, S., Nanthavong, K.
Pages: 6 p
Publication date: 2006

Host publication information
Title of host publication: Proceedings of the 2nd Joint International Conference on "Sustainable Energy and Environment (SEE 2006)" 21-23 November, 2006, Bangkok, Thailand

Bibliographical note
Conference Proceedings CD-Rom
Contribution: organisation=ener,FACT1=1
Source: researchoutputwizard
Source ID: 17171
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific

Modeling of Fine Particles and Alkali Metal Compounds in Kraft Recovery Boiler Furnace

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering, Research group: Power Plant and Combustion Technology, Urban circular bioeconomy (UrCirBio)
Contributors: Leppänen, A., Välimäki, E., Oksanen, A.
Number of pages: 8
Pages: 1-8
Publication date: 2011

Host publication information
Title of host publication: The 2011 TAPPI PEERS Conference, 2-5 October 2011, Oregon Convention Center in Portland, Oregon USA
Place of publication: Norcross, GA
Publisher: TAPPI

Publication series
Name: TAPPI PEERS Conference
Publisher: TAPPI
URLs:

http://www.tappipeers.org

Bibliographical note
ei ut-numeroa 5.4.2014
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 6599
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Modeling of Finnish building sector energy consumption and greenhouse gas emission: specification of POLIREM policy scenario model

Monitoring needs have increased in recent years, and answers to various questions related to the energy use of the building stock are needed faster than before. POLIREM model is a calculation model that assesses the effect of different policy scenarios on the Finnish building stock. The model determines the energy consumption and greenhouse gas emissions, and its purpose is to assist in the reporting and scenario work. The model has a strong linkage with the statistical data, and a top-down approach, which makes the POLIREM different from previous bottom-up style building stock models.

The POLIREM model was originally developed at the Tampere University of Technology in MS excel environment. In this work, the model was converted into a coded version that ensures flexible scenario building, including ease of updating the input data, as well as enabling further integration of new features and/or data sources. This report provides a technical specification of the python-coded scenario model POLIREM.

This report is part of development work to establish national reporting system/evaluation scheme, and fulfils requirements for openness by describing transparently the used evaluation method for building

stock modelling.

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Department of Civil Engineering, Research group: Real estate development, Finnish Environment Institute
Contributors: Mattinen, M., Heljo, J.
Number of pages: 23
Publication date: 2016

Publication information
Publisher: Suomen ympäristökeskus
ISBN (Electronic): 978-952-11-4576-6
Original language: English

Publication series
Name: Reports of the Finnish Environment Institute
Publisher: Finnish Environment Institute
No.: 26/2016
ISSN (Electronic): 1796-1726
Keywords: modelling, building stock, Energy consumption, Scenarios, climate policy, environmental reporting, Greenhouse gases, EMISSIONS
URLs:

http://hdl.handle.net/10138/164571
Research output: Book/Report › Commissioned report › Professional

Modelling fume deposit growth in recovery boilers: effect of flue gas and deposit temperature
The high ash content of black liquor causes fouling problems in the Kraft recovery boiler. The ash-forming elements condense into submicron-sized fume particles in the superheater area and the boiler bank and can deposit on heat-transfer surfaces. The fume deposits can then lower heat-transfer rate, plug flue gas flow, and expose surfaces to corrosion. This paper presents the results of a sensitivity analysis obtained using a CFD (computational fluid dynamics)-based sub-model of the formation of fume particles and deposits, showing how flue gas and deposit surface temperatures affect instantaneous fume deposit growth. The results indicate that fume deposit growth is a self-limiting process because the growth rate decreases as the deposit surface temperature increases. On the other hand, increasing the flue gas temperature increases the fume deposition rate when the element release factors are kept constant.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Power Plant and Combustion Technology, University of Toronto, Canada, Valmet Technologies Oy
Contributors: Leppänen, A., Tran, H., Välimäki, E., Oksanen, A.
Number of pages: 8
Pages: 50-57
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Journal of Science and Technology for Forest Products and Processes
Volume: 4
Issue number: 1
ISSN (Print): 1927-6311
Ratings:

Scopus rating (2014): SJR 0.239 SNIP 0.28
Original language: English
URLs:

http://www.paptac.ca/en/publications/jfor

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-12-12
Publisher name: PAPTAC, Pulp and Paper Technical Association of Canada
Source: researchoutputwizard
Source ID: 924
Research output: Contribution to journal › Article › Scientific › peer-review

Modelling of anisotropic fatigue

A continuum approach for anisotropic fatigue is described. The approach is based on the idea of a moving endurance surface in
the stress space where the movement is described by a back-stress type tensor. The evolution associated with the movement is described by
a rate type equation. In addition, damage accumulation is governed by a rate type evolution equation, thus facilitating its use under arbitrary
complex loading conditions. The main emphasis of this paper is to discuss the possible forms of the endurance surface and pertinent
evolution equations to model high-cycle anisotropic fatigue. Suggestions towards a unified model capturing the low-cycle regime are also
given.

General information

Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Civil Engineering, Lund University
Contributors: Holopainen, S., Kouhia, R., Ottosen, N. S., Matti, R., Saksala, T.
Number of pages: 2
Pages: 1822-1823
Publication date: 2016

Host publication information

Title of host publication: Contributions to the foundations of multidisciplinary research in mechanics : Papers presented during the 24th International Congress of Theoretical and Applied Mechanics ICTAM2016, Montreal, Canada, 21-26, Aug. 2016
Volume: 3
Publisher: IUTAM
Editor: Floryan, J.
ISBN (Electronic): 978-0-660-05459-9
URLs:

http://iutam.org/publications/ictam-proceedings/ictam_2016/
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Modelling of plastic culvert and road embankment interaction in 3D

A series of 3D Finite Element simulations was performed to investigate the effect of different factors influencing the distortions undergone by a plastic culvert tube while subject to external loading from a heavy truck. The applied simulation model was verified by full-scale loading tests carried out on a number of actual culvert installation sites. Based on the results of the study, it can be concluded that both installation depth and quality of the material surrounding the culvert have a dominant effect on culvert distortions while the effects of material quality above the culvert and the type of tyre configuration transmitting the wheel load are much less pronounced.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Research area: Infrastructure Construction, Research group: Earth Constructions
Contributors: Kolisoja, P., Kalliainen, A.
Number of pages: 8
Pages: 427-434
Publication date: 2016
Peer-reviewed: Yes

Publication information

Journal: Procedia Engineering
Volume: 143
ISSN (Print): 1877-7058
Ratings:

Scopus rating (2016): CiteScore 0.9 SJR 0.286 SNIP 0.725
Original language: English
Electronic versions:

Kolisoja & Kalliainen Procedia Engineering Copy
DOIs:

10.1016/j.proeng.2016.06.054
URLs:
http://urn.fi/URN:NBN:fi:tty-201608164416
Research output: Contribution to journal › Article › Scientific › peer-review

Modelling of seep through of humidity to electric connector with stochastic processes

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Materials Science, Research group: Tribology and Machine Elements, Automation and Hydraulic Engineering, Research group: Autonomous heavy duty vehicles, Sandvik Mining and Construction Oy
Contributors: Ojala, P., Hietala, J., Miettinen, J., Julkunen, P., Nieminen, I.
Publication date: 2017

Host publication information
Title of host publication: ESREL 2017. Safety and Reliability. Theory and Applications
Publisher: CRC Press
Editors: Cepin, M., Bris, R.
ISBN (Print): 978-1-138-62937-0
ISBN (Electronic): 978-1-351-80973-3
DOIs:
10.1201/9781315210469-384

Bibliographical note
EXT="Julkunen, Pasi"
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Municipal challenges in managing a building with noted health symptoms

Purpose

This study aims to present property management challenges that municipalities have encountered regarding a public building with noted building-related symptoms. The study goes on to provide reasons for the failure of attempts to manage the symptoms and discusses the current challenges concerning the process.

Design/methodology/approach

A participatory case study was used as the research methodology to identify the current challenges concerning a municipal approach to managing the building-related symptoms in a case-study building. The researchers scrutinised the history of the health symptom management process and attended the project planning meetings focused on the investigation of the condition of the building.

Findings

Multiple challenges concerning maintenance and omitted or postponed repair actions, as well as vagueness in the management process were found. In addition to this, it was noted that the complexity of the initial design of the building and vandalism have resulted in challenges for the maintenance and moisture performance of the building structures. According to the study, more orderliness and a more systematic process is needed when managing a municipal property.

Practical implications

The identified property management challenges may be of practical value for the facility managers and the property owners, especially when managing the building-related symptoms and a damaged building.

Originality/value

This study highlights the importance of having an in-depth understanding of condition assessments as well as proper maintenance and timely repairs for the successful management of the building-related symptoms in a municipal building. This is a pilot project in a larger project of management of building refurbishment.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Civil Engineering, Research group: Responsible Construction

Contributors: Uotila, U., Saari, A., Junnonen, J.
Number of pages: 13
Publication date: Nov 2019
Peer-reviewed: Yes

Publication information
Journal: Facilities
ISSN (Print): 0263-2772
Ratings:
Scopus rating (2019): CiteScore 2.1 SJR 0.399 SNIP 0.933
Original language: English
Electronic versions:
Municipal challenges in managing a building with noted health symptoms
DOIs:
10.1108/F-07-2019-0073
URLs:
http://urn.fi/URN:NBN:fi:tuni-201912126801
Research output: Contribution to journal › Article › Scientific › peer-review

Näkökulma-kolumni: Putkiremontit kestävät aivan liian kauan

General information
Publication status: Published
Organisations: Civil Engineering
Contributors: Saari, A.
Publication date: 24 Nov 2016

Publication information
Publisher: Sanoma Talotekniikkajulkaisut Oy
Year: 2016
Original language: Finnish
URLs:
http://www.rakennuslehti.fi/kirjoittajat/arto-saari/
Research output: Other contribution › Scientific

Näkökulma: Maltti on valttia Suomellekin nollaenergiatavoitteita asetettaessa

General information
Publication status: Published
MoE publication type: E1 Popularised article, newspaper article
Organisations: Department of Civil Engineering, Research group: Building Physics
Contributors: Vinha, J.
Publication date: 13 Feb 2015
Peer-reviewed: Unknown

Publication information
Journal: Rakennuslehti
Issue number: 6
Original language: Finnish
URLs:
http://www.digipaper.fi/rakennuslehti/127077/index.php?pgnumb=2
Research output: Contribution to journal › Article › General public

Näkymätönt Porrii. Porin veden historia

General information
Publication status: Published
MoE publication type: C1 Separate scientific books
Organisations: Department of Chemistry and Bioengineering, Department of Civil Engineering, Former organisation of the author
Contributors: Juuti, P. S., Katko, T. S., Louekari, S. M., Rajala, R. P.
Publication date: 2010

Publication information
Place of publication: Pori
Publisher: Porin Vesi
ISBN (Print): 978-952-5414-80-6
Original language: Finnish
Electronic versions:
juuti_nakymatont_porrii.pdf
URLs:
http://urn.fi/URN:NBN:fi:tty-2011041513487

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 8245
Research output: Book/Report › Book › Scientific › peer-review

Nanoscale Surface Processing of Extrusion Coated Substrates with Atmospheric Plasma Technology

General information
Publication status: Published
Organisations: Department of Materials Science, Research group: Paper Converting and Packaging, Engineering materials science and solutions (EMASS)
Contributors: Lahti, J.
Publication date: 2013
Peer-reviewed: Unknown
Event: Paper presented at 14th TAPPI. European Place Conference 6-8 May 2013 Swissotel Dresden, Germa, .
Research output: Other conference contribution › Paper, poster or abstract › Scientific

Nature and extent of potable water consumption in Tampere (Finland) and Carletonville (South Africa)

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Civil Engineering, Research group: Capacity Development of Water and Environmental Services CADWES
Contributors: Rajala, R., Juuti, P., Nealer, E.
Number of pages: 14
Pages: 149-162
Publication date: 2019

Host publication information
Title of host publication: Resilient Water Services and Systems: The Foundation of Well-Being
Publisher: IWA Publishing
ISBN (Print): 9781780409764
ISBN (Electronic): 9781780409771
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Need of Services and Understanding of Service Providers in Water and Sanitation: A Case of Ethiopia

Water and sanitation services are basic requirements for the development of a nation. The provision of these services should necessarily be arranged by the national government through policies, and long-term and short-term plans. Moreover, follow-up of the implementation of principle in policies and plans will determine the service level on the ground. This paper is intended to explore gaps in the policy-making and implementation in the areas of water supply in Ethiopia. Review of Ethiopian water sector policy, universal access plans, growth and transformation plans and other literature are employed to achieve the objective of this paper. Moreover, the experiences of the first author that he acquired during data collection for his doctoral study are taken into account to draw conclusions. Hence, the study shows that standards set at the federal level fail to consider the actual situation on the ground and the experts at implementation level are to interpret some aspects of the policy ambiguously. Therefore, this paper recommends the policy-makers and higher officials to consult the people in charge of putting policies in effect to have contextualized and work for uniform desired- output. Service providers need to understand the notion of the receiving community in order to provide the services that satisfy the users.

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering

Contributors: Behailu, B. M., Mattila, H.
Number of pages: 10
Pages: 431-440
Publication date: 2016

Host publication information
Title of host publication: Proceedings of the CIB World Building Congress 2016 Volume IV : Understanding impacts and functioning of different solutions
Publisher: Tampere University of Technology
Editors: Nenonen, S., Junnonen, J.
ISBN (Print): 978-952-15-3744-8
URLs:
https://tutcris.tut.fi/portal/files/6186967/WBC16_Vol_4.pdf
URLs:
http://urn.fi/URN:ISBN:978-952-15-3744-8
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Negotiating Groundwater Governance: Lessons from Contentious Aquifer Recharge Projects

Groundwater is an invaluable part of our natural, built, and socio-economic environments. In global context, groundwater is the largest freshwater resource: almost half of all drinking water is abstracted from underground. During the last few decades, Finnish community water supply has increasingly relied on natural and artificially recharged groundwater as raw water source. Currently, their combined share of the water supplied is some 66 percent, out of which 16 percent is artificially recharged. However, potential groundwater areas and places for groundwater recharge are sparsely situated. Thus, large city centres, with their increasing need for fresh water supply, are obliged to withdraw groundwater from afar, often crossing municipal borders. This may cause tensions between different jurisdictional units; generally, between rural and urban areas. This research illustrates how cooperation between municipalities can turn into a conflict. Indeed, there are several examples of local conflicts around the inter-municipal groundwater projects in Finland. Many projects which are justified on both technical and economic grounds have problems in gaining legitimacy among local inhabitants. Oppositions emerge and projects may go through long litigation processes.

A contentious groundwater project can be classified as a complex management problem: it is unpredictable, uncontrollable, and it has several, often contradictory interpretations. Therefore, conventional groundwater management approaches, drawing from expert-based instrumental rationality, often are insufficient for successful project planning and implementation. Indeed, the emerging paradigm emphasizes collaborative approaches to complex management problems in the fields of natural resources management as well as urban planning. Water services (water supply, wastewater treatment, and storm water management) are inherently bound to these fields through their multiple connections with aquatic environment, required technical infrastructures, and influence on socio-economic development.

The main objective of this study was to find new perspectives for groundwater governance by analysing contentious cases that operate in field of water services, thus connecting the contexts of natural resources management and urban planning. Accordingly, the research problem was formulated as follows: Which are the major constraints in large scale groundwater projects from the perspective of collaborative governance, and what lessons can be drawn for future collaboration?

The research problem was addressed through negotiation theory and discursive framework which adhere to social constructionist tradition. Through these theoretical and methodological considerations, this study enclosed conflict analysis and discourse analysis. These methods were exploited in a comprehensive analysis of the two case studies where inter-municipal water supply projects, based on the managed aquifer recharge (MAR) technology, were contested by local inhabitants. First case is situated to southwestern coastal area of Turku Region. It started already in the 1970s as a long-distance water transfer project, and was finalized in 2010 when an MAR plant started to operate on the esker of Virttaankangas. However, the other case, situated to Tampere Region, started in 1993, and the process is still unfinished.

The results of this study indicate that the water management sector is strongly grounded on instrumental rationality when solely expert knowledge is considered as a legitimate source of information. Accordingly, planning and management of the MAR projects concentrated mainly on the visible tip of an iceberg, instead of managing the whole. The interaction between parties was based on competitive mindset and zero-sum game; thus, the underlying interests and the complexity of the project were not recognized. Strong positions were taken, which precluded the possibility of finding mutual gains.

Although cases involved some collaborative efforts, they were used only as casual tools without really relying on collaborative rationality. However, in groundwater governance it should be other way round: the core should be in collaborative rationality while some of the tools can be obtained from rationalistic expert-based planning. Thus, legitimacy for the project should be gained through joint knowledge production as well as interaction, where addressing stakeholders' interests instead of predefined goals could help in finding mutual gains and creative new options for collaboration. Furthermore, in this process, water managers and experts should be more like facilitators than holders of the only legitimate source of knowledge and the stakeholders like partners rather than informants or adversaries.

General information
Publication status: Published
MoE publication type: G5 Doctoral dissertation (article)
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Contributors: Kurki, V.
Number of pages: 76
Publication date: 17 Jun 2016

Publication information
Publisher: Tampere University of Technology
ISBN (Print): 978-952-15-3751-6
ISBN (Electronic): 978-952-15-3762-2
Original language: English

Publication series
Name: Tampere University of Technology. Publication
Volume: 1387
ISSN (Print): 1459-2045
Electronic versions:

Kurki 1387
URLs:

http://urn.fi/URN:ISBN:978-952-15-3762-2
Research output: Book/Report › Doctoral thesis › Collection of Articles

Negotiating water governance: towards cooperation in contentious groundwater recharge projects

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering
Contributors: Kurki, V.
Pages: 91-102
Publication date: 2016

Host publication information
Title of host publication: Proceedings of the CIB World Building Congress 2016: Volume I - Creating built environments of new opportunities
Publisher: Tampere University of Technology. Department of Civil Engineering
ISBN (Electronic): 978-952-15-3741-7
URLs:

http://urn.fi/URN:ISBN:978-952-15-3741-7
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Nitrogen recovery from reject water in a 3-chamber bioelectroconcentration cell

General information
Publication status: Published
Organisations: Chemistry and Bioengineering, Research group: Bio- and Circular Economy, Advanced Water Management Centre, University of Queensland
Contributors: Koskue, V., Ledezma, P., Freguia, S., Kokko, M.
Publication date: Sep 2018
Peer-reviewed: Unknown
Event: Paper presented at EU-ISMET 2018, Newcastle upon Tyne, United Kingdom.
Research output: Other conference contribution › Paper, poster or abstract › Scientific

Numerical modeling of fine particle and deposit formation in a recovery boiler
In kraft pulp mills, black liquor is concentrated and burned in recovery boilers to produce steam and power and to recover pulping chemicals. Black liquor contains a large amount of alkali compounds, which form ash with low melting temperatures upon combustion. This causes many problems in recovery boiler operation, including fouling of the heat transfer surfaces, plugging of the flue gas passages, reduction of the heat transfer rate, and corrosion of the superheater tubes. This paper presents a model for simulating fine fume particles formed as a result of condensation of alkali compound vapors in the recovery boiler. The modeling method combines CFD modeling, equilibrium chemistry, and fine particle dynamics in a way that enables simulation of a full scale three-dimensional boiler environment. The model has

been partially validated with measurements performed in an operating recovery boiler. The modeling results, particularly for the fume particle composition, agree well with the actual measurements. (C) 2014 Elsevier Ltd. All rights reserved.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Power Plant and Combustion Technology, Urban circular bioeconomy (UrCirBio), University of Toronto, Canada, VTT Technical Research Centre of Finland, Valmet Technologies Oy
Contributors: Leppänen, A., Tran, H., Taipale, R., Välimäki, E., Oksanen, A.
Number of pages: 9
Pages: 45-53
Publication date: 1 Aug 2014
Peer-reviewed: Yes
Early online date: 16 Apr 2014

Publication information
Journal: Fuel
Volume: 129
ISSN (Print): 0016-2361
Ratings:

Scopus rating (2014): CiteScore 5.6 SJR 1.634 SNIP 2.29
Original language: English
Keywords: Kraft recovery boiler, Alkali metal, Fine particle, Deposition, Computational fluid dynamics, FUME FORMATION , BLACK LIQUOR, COMBUSTION, BEHAVIOR, DUST
Electronic versions:

leppanen_numerical_modeling_of_fine_particle
DOIs:

10.1016/j.fuel.2014.03.046
URLs:

http://urn.fi/URN:NBN:fi:tty-201412051586

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-04-29
Publisher name: Elsevier Ltd
Source: researchoutputwizard
Source ID: 922
Research output: Contribution to journal › Article › Scientific › peer-review

Nutrient and organic matter removal from wastewaters with microalgae

Use of microalgae in wastewater treatment has been increasingly studied to integrate with or replace the present treatment systems for removal of nutrients and other pollutants. The potential advantages of this integration (wastewater treatment and microalgal cultivation) could be simultaneous recovery of nitrogen and phosphorus and the use of produced microalgal biomass as feedstock for e.g. biofuel, fertilizer and/or energy. However, the use of microalgae in wastewater treatment is mainly in research stage due to e.g. low nutrient removal and microalgal biomass growth. The aim of this thesis was to enable efficient nutrient and organic matter removal from wastewaters by microalgae while promoting microalgal biomass production. Chlorella vulgaris and Scenedesmus acuminatus were successfully grown in batch photobioreactors with liquid digestates from anaerobic digestion (AD) of biosludge from a municipal wastewater treatment plant (ADMW) and a pulp and paper mill wastewater treatment plant (ADPP). The final ammonium removal efficiencies were above 97% when cultivating both microalgae separately in ADPP, however, only 24% and 44% of ammonium were removed from ADMW by C. vulgaris and S. acuminatus, respectively. Both microalgae efficiently removed phosphate (>96%), while color (74–80%) and soluble COD (27–39%) were partially removed from ADMW and ADPP. The obtained highest S. acuminatus biomass concentration (7.8–10.8 g L-1 VSS) in ADPP is among the highest yields reported for microalgae in real wastewaters. Higher S. acuminatus biomass yields were obtained in thermophilic ADPP (without and with pretreatment prior to AD: 10.2±2.2 and 10.8±1.2 g L-1, respectively) than in pretreated mesophilic ADPP (7.8±0.3 g L-1). In addition, the highest microalgal biomass concentration and methane yields were obtained in the same integrated AD and microalgal culti- vation system (thermophilic AD with pretreatment). The iron (0.1, 1.0, and 1.9 mg L-1) and sulfate-sulfur (3.7, 20, and 35.8 mg L-1) concentrations were found to affect nitrogen removal efficiency and microalgal biomass concentration more in the media with nitrate than with ammonium, probably due to different microalgal assimilation mechanisms for nitrate and ammonium. In this study, synthetic medium with nitrate as nitrogen source with 1.0 mg L-1 iron and 35.8 mg L-1 sulfate-sulfur enabled the highest microalgal biomass concentration. The effect of iron concentration on nitrate removal efficiency and microalgal growth was more significant than that of sulfate concentration, while the interaction effect between sulfate and iron was not observed. The average ammonium removal efficiency (14 to 30%) and microalgal biomass concentration (0.50 to 1.17 g particulate organic carbon per L) in continuous-flow membrane photobioreactor were promoted by adding a low concentration of zeolite (0.5 g L-1). The zeolite likely provided a habitat for attached growth of microalgae and high availability of ammonium for growth on the surface of the zeolite due to ammonium adsorption to zeolite. Further increase in zeolite concentration (from 0.5 to 1 and 5 g L-1) did not improve

ammonium removal efficiency or biomass concentration. This was likely due to the increased solution turbidity caused by breaking apart of added zeolite particles into finer particles, which reduced light availability. In summary, this work showed the possibility of utilizing microalgae in wastewater treatment to efficiently remove nutrients and organic matter, and simultaneously promote microalgal growth. Selecting suitable microalgal species for the specific wastewater to remove nutrients and organic matter is essential to promote algae-based wastewater treatment applications.

General information
Publication status: Published
MoE publication type: G5 Doctoral dissertation (article)
Organisations: Materials Science and Environmental Engineering
Contributors: Tao, R.
Number of pages: 153
Publication date: 22 May 2019

Publication information
Publisher: Tampere University
Original language: English

Publication series
Name: Tampere Univeristy Dissertations
URLs:

http://urn.fi/URN:NBN:fi:tuni-201906192108. Embargo ended: 22/05/20
Research output: Book/Report › Doctoral thesis › Collection of Articles

Occupational exposure to electric and magnetic fields during work tasks at 110 kV substations in the Tampere region

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L., Pääkkönen, R.
Pages: 252-254
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Bioelectromagnetics
Volume: 31
Issue number: 3
ISSN (Print): 0197-8462
Ratings:

Scopus rating (2010): SJR 0.827 SNIP 1.251
Original language: English
DOIs:

10.1002/bem.20555
URLs:

http://www3.interscience.wiley.com/journal/34135/home

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 8437
Research output: Contribution to journal › Article › Scientific › peer-review

Occupational Exposure to Electric and Magnetic Fields While Working at Switching and Transforminig Stations of 110 kV

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L., Kuisti, H., Pääkkönen, R., Vanhala, P., Elovaara, J.
Pages: 526-536
Publication date: 2011
Peer-reviewed: Yes

Publication information
Journal: Annals of Occupational Hygiene
Volume: 55
Issue number: 5
ISSN (Print): 0003-4878
Ratings:

Scopus rating (2011): CiteScore 3.4 SJR 1.194 SNIP 1.59
Original language: English
DOIs:

10.1093/annhyg/mer013

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 6418
Research output: Contribution to journal › Article › Scientific › peer-review

Occupational Exposure to Electric Fields and Currents Associated With 110 kv Substation Tasks

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L., Kuisti, H. A., Tarao, H., Elovaara, J. A.
Pages: 438-442
Publication date: 2012
Peer-reviewed: Yes

Publication information
Journal: Bioelectromagnetics
Volume: 33
Issue number: 5
ISSN (Print): 0197-8462
Ratings:

Scopus rating (2012): CiteScore 4.2 SJR 0.628 SNIP 1.155
Original language: English
DOIs:

10.1002/bem.21711

Bibliographical note
Contribution: organisation=epr,FACT1=1
Publisher name: Wiley Periodicals, Inc
Source: researchoutputwizard
Source ID: 4530
Research output: Contribution to journal › Article › Scientific › peer-review

Occupational exposure to electric fields and induced currents associated with 400 kV substation tasks from different service platforms

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L., Elovaara, J. A., Kuisti, H. A.
Pages: 79-83
Publication date: 2011
Peer-reviewed: Yes

Publication information
Journal: Bioelectromagnetics
ISSN (Print): 0197-8462
Ratings:

Scopus rating (2011): CiteScore 4.5 SJR 0.539 SNIP 1.223
Original language: English
DOIs:

10.1002/bem.20612
URLs:

http://wileyonlinelibrary.com

Bibliographical note
Poistettu tupla r=3246
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 6417
Research output: Contribution to journal › Article › Scientific › peer-review

Occupational Exposure to Extremely Low Frequency Electric Fields in Office Work

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Pääkkönen, R., Tarao, H., Gobba, F., Korpinen, L.
Pages: 823-825
Publication date: 2012

Host publication information
Title of host publication: PIERS 2012 Moscow Proceedings, August 19-23, 2012, Moscow, Russia
Publisher: Electromagnetics Academy
ISBN (Print): 978-1-934142-22-6

Publication series
Name: Progress in Electromagnetics Research Symposium
ISSN (Print): 1559-9450
URLs:

http://www.piers.org

Bibliographical note
ei ut-numeroa 27.8.2013
Contribution: organisation=epr,FACT1=1
Publisher name: Electromagnetics Academy
Source: researchoutputwizard
Source ID: 4997
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Opening of the seminar

General information
Publication status: Published
Organisations: Department of Civil Engineering
Contributors: Katko, T. S.
Publication date: 29 Oct 2013
Peer-reviewed: Unknown
Event: Paper presented at 2nd UNECWAS SEMINAR, Tampere, Finland.
URLs:

http://www.cadwes.com/upcoming-second-unecwas-seminar-29-10-2013/
Research output: Other conference contribution › Paper, poster or abstract › Scientific

Operationalising the right to water and sanitation and gender equality via appropriate technology in rural Nepal
Can a tap, a squat toilet, or an improved cooking stove – all simple rural technologies – make a contribution to achieving human rights and the Sustainable Development Goals (SDGs)? What are the ‘soft’ elements, beyond the technology, that are needed? This article explores how, the principles of human rights based approach (HRBA), gender equality and social inclusion (GESI) are mainstreamed and operationalized through two bilateral rural water projects in Nepal - the Finland and Nepal-funded Rural Water Supply and Sanitation Project in Western Nepal (RWSSP-WN) and the Rural Village Water Resources Management Project (RVWRMP). The projects utilise a combination of hands-on technical assistance, community participation and appropriate technologies to achieve the Right to Water and Sanitation, as well as making a contribution to the SDGs. The technologies include water supply systems; renewable energy, including micro-hydropower schemes, improved cooking stoves, improved water mills and hydraulic ram pumps; as well as water seal toilets. However, simply providing technology is not enough. It is critical that it is applied within a strong planning and implementation framework, integrated in local government and communities, but supported with skilful facilitation. This case study focuses on the results achieved and critical lessons learned regarding gender equality and empowerment (SDG 5), and access to water and sanitation (SDG 6). The lessons learned, including the important role of the technical

staff in the project modality, are valuable for planners and implementers of water and sanitation projects elsewhere.

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Civil Engineering
Contributors: White, P., Rautanen, S., Nepal, P. R.
Number of pages: 23
Pages: 217-239
Publication date: 1 Mar 2017

Host publication information
Title of host publication: Human Rights and Technology
Place of publication: Costa Rica
Publisher: University of Peace, Costa Rica
Editor: Garrido Villareal, M.
ISBN (Electronic): 978-9930-542-00-2
Keywords: 214 Mechanical engineering, Water and Sanitation, 5203 Development Studies, Human Rights, Gender, Nepal, Social Inclusion
Source: Bibtex
Source ID: urn:de56f6bb4591a0c82a8d620136c3fd9c
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Osuuskunnat mukaan infrastruktuuripolitiikkaan

General information
Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Department of Chemistry and Bioengineering
Contributors: Heino, O., Anttiroiko, A.
Number of pages: 1
Pages: 54-54
Publication date: 2014
Peer-reviewed: Unknown

Publication information
Journal: Osuustoiminta
Volume: 105
Issue number: 5
ISSN (Print): 1236-4835
Original language: Finnish

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2015-01-15
Source: researchoutputwizard
Source ID: 440
Research output: Contribution to journal › Article › Professional

Pääkaupunkiseudun moderni jätevedenpuhdistus ja Viikinmäen puhdistamo

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Civil Engineering, University of Tampere
Contributors: Juuti, P., Rajala, R.
Pages: 91-113
Publication date: 2010

Host publication information
Title of host publication: Metropoli ja meri - 100 vuotta jätevedenpuhdistusta Helsingissä
Publisher: TamPub
Editors: Juuti, P., Rajala, R., Katko, T.
URLs:
http://urn.fi/urn:isbn:978-952-6604-09-1

Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Pääkirjoitus. Veden keskeinen merkitys yhteiskunnassa ja yhdyskunnissa

General information
Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Department of Chemistry and Bioengineering
Contributors: Katko, T.
Pages: 4-7
Publication date: 2011
Peer-reviewed: No

Publication information
Journal: Ympäristöhistoria: Finnish Journal of Environmental History
Volume: 1
Issue number: 2
ISSN (Print): 1799-6953
Original language: Finnish
URLs:
http://www.uta.fi/yky/tutkimus/historia/projektit/iehg/Ymparistohistoria/No0211/Yfjeh022011.pdf

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Publisher name: International Environmental History Group (IEHG)
Source: researchoutputwizard
Source ID: 6327
Research output: Contribution to journal › Article › Scientific

Pääkirjoitus : Vesihuoltolaitosten historiat imagon nostajana / Editorial : Relevance of history for current water services management and governance

General information
Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Department of Chemistry and Bioengineering
Contributors: Katko, T. S.
Number of pages: 3
Publication date: 2013
Peer-reviewed: No

Publication information
Journal: Ympäristöhistoria: Finnish Journal of Environmental History
Issue number: 2
ISSN (Print): 1799-6953
Original language: Finnish
URLs:
http://www.uta.fi/yky/tutkimus/historia/projektit/iehg/Ymparistohistoria/No22013/YFJEH%20nro%202%202013-2.pdf
http://www.uta.fi/yky/tutkimus/historia/projektit/iehg/Ymparistohistoria/No2

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-11-29
Publisher name: IEHG
Source: researchoutputwizard
Source ID: 2521
Research output: Contribution to journal › Article › Scientific

Päätelmät yhdyskuntajätehuollon markkinainnovaatioista - taustat, kiistat ja sovellukset

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering
Contributors: Valkama, P., Heino, O., Kallio, O.
Number of pages: 12
Pages: 159-170

Publication date: 2013

Host publication information
Title of host publication: Markkinainnovaatiot yhdyskuntajätehuollossa : tutkimus jätehuoltopalvelujen markkinoiden evoluutiosta, sovelluksista ja jännitteistä kunnallisen ja yksityisen sektorin rajapinnassa
Place of publication: Tampere
Publisher: Tampereen yliopisto, Johtamiskorkeakoulu
Editor: Valkama, P.
ISBN (Print): 978-951-44-9163-4
ISBN (Electronic): 978-951-44-9164-1
URLs:
http://www.uta.fi/jkk/yhteystiedot/hallintotiede/valkama/projects/subprojects/VALKAMA3kirjapainojune2013.pdf

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-07-29
Source: researchoutputwizard
Source ID: 3634
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Päijänne-tunneli ja kolmisopimus

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: University of Tampere
Contributors: Juuti, P., Rajala, R.
Pages: 27-38
Publication date: 2009

Host publication information
Title of host publication: Vesihuoltoyhteistyötä yli rajojen : PK-seudun yhteistyöhankkeet ja yhdistämissuunnitelmat ennen ja nyt Espoon näkökulmasta
Publisher: University of Tampere
Editors: Juuti, P., Rajala, R.
ISBN (Print): 978-951-857-559-0
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Palo, jano, terveys, hygienia

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, University of Tampere
Contributors: Juuti, P., Rajala, R., Katko, T. S.
Pages: 13-20
Publication date: 2009

Host publication information
Title of host publication: Elämän virta : Kajaanin veden historia
Publisher: TamPub
Editors: Juuti, P., Rajala, R., Katko, T.
ISBN (Print): 978-951-800-320-8
ISBN (Electronic): 978-951-44-7657-0
URLs:
http://urn.fi/urn:isbn:978-951-44-7657-0
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Paperinjalostus- ja pakkaustekniikan tutkimusyksikkö uudistaa kurssitarjontaa

General information
Publication status: Published
MoE publication type: E1 Popularised article, newspaper article
Organisations: Department of Energy and Process Engineering
Contributors: Lahti, J., Kuusipalo, J.

Number of pages: 1
Pages: 1-1
Publication date: 2010
Peer-reviewed: Unknown

Publication information
Journal: Anturi
Issue number: 5
ISSN (Print): 0782-7849
Original language: Finnish

Bibliographical note
Contribution: organisation=epr pap,FACT1=1
Source: researchoutputwizard
Source ID: 8550
Research output: Contribution to journal › Article › General public

Paradigma alternativo : O papel das cooperativas e das autoridades locals

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering
Contributors: Hukka, J. J., Katko, T. S.
Number of pages: 24
Pages: 214-237
Publication date: 2013

Host publication information
Title of host publication: Politica publica e gestao de servicos de saneamento
Place of publication: Belo Horizonte; Rio de Janeiro
Publisher: Editora da Universidade Federal de Minas Gerais (UFMG); Editora Fiocruz
Editors: Heller, L., Esteban Castro, J.
ISBN (Print): 978-85-7041-953-8

Bibliographical note
Política Pública e Gestão de Serviços de Saneamento (Public Policy and Management of Water and Sanitation Services)
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-11-29
Source: researchoutputwizard
Source ID: 2331
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Paradigman jäljillä: Tutkimus vesihuollon ajattelumalleista

The municipalities of Finland are facing interesting times; the public sector as a whole is struggling with economic and productivity challenges and is striving to find innovative development strategies for the future. The prevailing conditions are reflected in the built environment, in the technical sector of municipalities and, therefore, in infrastructure services such as water services. Generally speaking, water services are perceived to be static in nature that have operated successfully in the relatively unchanging conditions of history. However, the increasing complexity and faster rate of change in the operating environment are forcing water services to be more innovative and able to explore their own role as a part of variety of systems as well as to formulate problems accordingly. The way water services are thought and seen ultimately defines what kind of solutions are produced and services delivered. Thinking patterns related to water services shape its future.

These thinking patterns – the paradigms of water services – are in the spotlight in this doctoral dissertation. For this purpose, the conceptual framework of two alternative paradigms of water services is constructed. Paradigm 1 represents a production-oriented world view that rests on reductionist thinking, production-based value creation logic, and closed-context expertise. Paradigm 2 embodies a service-oriented world view that is based on holistic systems thinking, service-based value creation logic, and open-context expertise. Based on this conceptual framework, the four selected research articles are explored, following the principles of qualitative research. The purpose is to find and clarify the paradigm related clues of the articles, and hence approach the question: how are water services thought?

The theme of the first article relates to the relationships between water utilities and external service providers. It shows that the relationships are based on mistrust that must be managed by continuously tightening contracts. As a consequence of the dominant paradigm, there is no foothold left for building trust between parties. The second article highlights the identity of water services by asking what kind of meanings water utilities place on water services. Reflecting the findings in relation to the paradigms, it is seen that the aim of water services is perceived to be the realization of top-

down imposed goals. This explains why sense-making with wider systemic meanings hardly occurs. The theme of the third article relates to the idea of inverse infrastructure, which refers to user[IV] driven developed infrastructures that have the characteristics of self-organization and volunteerism. These kinds of alternative infrastructure solutions shift the power of decision away from formal systems, hence this tendency is not necessarily favoured in the municipal infrastructure policy. In the light of paradigm exploration, municipal infrastructure policy should be enabling and integrative. The theme of the fourth article, in turn, deals with social norms. It is argued that following social norms over sectoral boundaries has an effect on trust and acceptance towards the water services.

Regarding all four articles, this study revealed that, along with material and quantitative dimensions, there resides invisible system dimensions affecting the service that is ultimately provided. If water services are perceived by a production-oriented paradigm, these less obvious system dimensions are ignored or formulated in an inappropriate manner. A service-oriented paradigm is, in turn, more responsive to different system dimensions; it also emphasizes that the less obvious phenomena can have an influence on the service as a whole. From the research that has been carried out, it can be concluded that if the purpose of water services is to create well-being for the wider society, then there seems to be a need for a paradigm shift that puts more consideration on the changing and ever more complex operating environment. In that case, the ways water services are thought and understood have to change towards a world view outlined by the serviceoriented paradigm. It helps to rediscover the linkage between the water services and societal development.

General information
Publication status: Published
MoE publication type: G5 Doctoral dissertation (article)
Organisations: Department of Chemistry and Bioengineering
Contributors: Heino, O.
Number of pages: 111
Publication date: 15 Apr 2016

Publication information
Place of publication: Tampere
Publisher: Tampere University of Technology
ISBN (Print): 978-952-15-3716-5
ISBN (Electronic): 978-952-15-3729-5
Original language: Finnish

Publication series
Name: Tampere University of Technology. Publication
Volume: 1374
ISSN (Print): 1459-2045
Electronic versions:

Heino 1374
URLs:

http://URN.fi/URN:ISBN:978-952-15-3729-5
Research output: Book/Report › Doctoral thesis › Collection of Articles

Parameters Affecting the Upcycling of Waste Cotton and PES/CO Textiles

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Materials Science, Research group: Fibre Materials
Contributors: Vats, S., Rissanen, M.
Number of pages: 12
Pages: 166-177
Publication date: 30 May 2016
Peer-reviewed: Yes

Publication information
Journal: Recycling
Volume: 1
Issue number: 1
ISSN (Print): 2313-4321
Original language: English
Electronic versions:

recycling-01-00166
DOIs:

10.3390/recycling1010166

URLs:
http://urn.fi/URN:NBN:fi:tty-201605304201
Research output: Contribution to journal › Article › Scientific › peer-review

Particle growth with photochemical age from new particle formation to haze in the winter of Beijing, China
Secondary aerosol formation in the aging process of primary emission is the main reason for haze pollution in eastern China. Pollution evolution with photochemical age was studied for the first time at a comprehensive field observation station during winter in Beijing. The photochemical age was used as an estimate of the timescale attributed to the aging process and was estimated from the ratio of toluene to benzene in this study. A low photochemical age indicates a fresh emission. The photochemical age of air masses during new particle formation (NPF) days was lower than that on haze days. In general, the strongest NPF events, along with a peak of the formation rate of 1.5 nm ($J_{1.5}$) and 3 nm particles (J_3), were observed when the photochemical age was between 12 and 24 h while rarely took place with photochemical ages less than 12 h. When photochemical age was larger than 48 h, haze occurred and NPF was suppressed. The sources and sinks of nanoparticles had distinct relation with the photochemical age. Our results show that the condensation sink (CS) showed a valley with photochemical ages ranging from 12 to 24 h, while H_2SO_4 concentration showed no obvious trend with the photochemical age. The high concentrations of precursor vapours within an air mass lead to persistent nucleation with photochemical age ranging from 12 to 48 h in winter. Coincidently, the fast increase of $PM_{2.5}$ mass was also observed during this range of photochemical age. Noteworthy, CS increased with the photochemical age on NPF days only, which is the likely reason for the observation that the $PM_{2.5}$ mass increased faster with photochemical age on NPF days compared with other days. The evolution of particles with the photochemical age provides new insights into understanding how particles originating from NPF transform to haze pollution.

General information
Publication status: E-pub ahead of print
MoE publication type: A1 Journal article-refereed
Organisations: Physics, Research group: The Instrumentation, Emissions, and Atmospheric Aerosols Group, Beijing University of Chemical Technology, University of Helsinki, Shanghai Institute of Ceramics Chinese Academy of Sciences, Research Center for Eco-Environmental Sciences Chinese Academy of Sciences, Tsinghua University, Nanjing University
Contributors: Chu, B., Dada, L., Liu, Y., Yao, L., Wang, Y., Du, W., Cai, J., Dällenbach, K. R., Chen, X., Simonen, P., Zhou, Y., Deng, C., Fu, Y., Yin, R., Li, H., He, X. C., Feng, Z., Yan, C., Kangasluoma, J., Bianchi, F., Jiang, J., Kujansuu, J., Kerminen, V. M., Petäjä, T., He, H., Kulmala, M.
Number of pages: 7
Publication date: 2020
Peer-reviewed: Yes

Publication information
Journal: Science of the Total Environment
Volume: 753
Article number: 142207
ISSN (Print): 0048-9697
Original language: English
ASJC Scopus subject areas: Environmental Engineering, Environmental Chemistry, Waste Management and Disposal, Pollution
Keywords: Condensation sink, Haze, New particle formation, Photochemical aging, Pollution evolution
DOIs:
10.1016/j.scitotenv.2020.142207
Source: Scopus
Source ID: 85090708523
Research output: Contribution to journal › Article › Scientific › peer-review

Particulate Mass and Nonvolatile Particle Number Emissions from Marine Engines Using Low-Sulfur Fuels, Natural Gas, or Scrubbers
In order to meet stringent fuel sulfur limits, ships are increasingly utilizing new fuels or, alternatively, scrubbers to reduce sulfur emissions from the combustion of sulfur-rich heavy fuel oil. The effects of these methods on particle emissions are important, because particle emissions from shipping traffic are known to have both climatic and health effects. In this study, the effects of lower sulfur level liquid fuels, natural gas (NG), and exhaust scrubbers on particulate mass (PM) and nonvolatile particle number (PN greater than 23 nm) emissions were studied by measurements in laboratory tests and in use. The fuel change to lower sulfur level fuels or to NG and the use of scrubbers significantly decreased the PM emissions. However, this was not directly linked with nonvolatile PN emission reduction, which should be taken into consideration when discussing the health effects of emitted particles. The lowest PM and PN emissions were measured when utilizing NG as fuel, indicating that the use of NG could be one way to comply with up-coming regulations for inland waterway vessels. Low PN levels were associated with low elemental carbon. However, a simultaneously observed methane slip should be taken into consideration when evaluating the climatic impacts of NG-fueled engines.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Research group: The Instrumentation, Emissions, and Atmospheric Aerosols Group, Physics, Research area: Aerosol Physics, VTT Technical Research Centre of Finland, Finnish Meteorological Institute
Contributors: Lehtoranta, K., Aakko-Saksa, P., Murtonen, T., Vesala, H., Ntziachristos, L., Rönkkö, T., Karjalainen, P., Kuittinen, N., Timonen, H.
Number of pages: 8
Pages: 3315-3322
Publication date: 19 Feb 2019
Peer-reviewed: Yes

Publication information
Journal: Environmental Science and Technology
Volume: 53
Issue number: 6
ISSN (Print): 0013-936X
Ratings:

Scopus rating (2019): CiteScore 12.6 SJR 2.704 SNIP 2.06
Original language: English
DOIs:

10.1021/acs.est.8b05555
Research output: Contribution to journal › Article › Scientific › peer-review

Part I: Early systems and innovations. Ch 3 Introduction: Early cultures and water

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P. S., Katko, T. S., Vuorinen, H. S.
Pages: 11-16
Publication date: 2007

Host publication information
Title of host publication: 2007. Environmental History of Water - Global views on community water supply and sanitation. IWA Publishing
Editors: Juuti P.S., K. T., Vuorinen, H.

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14498
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Part III: Modern Urban Infrastructure. Ch 20 Introduction

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P. S., Katko, T. S., Vuorinen, H. S.
Pages: 509-510
Publication date: 2007

Host publication information
Title of host publication: 2007. Environmental History of Water - Global views on community water supply and sanitation. IWA Publishing
Editors: Juuti P.S., K. T., Vuorinen, H.

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14500
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Part III: Modern Urban Infrastructure. Ch 20 Introduction

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P. S., Katko, T. S., Vuorinen, H. S.
Pages: 265-270
Publication date: 2007

Host publication information
Title of host publication: 2007. Environmental History of Water - Global views on community water supply and sanitation. IWA Publishing
Editors: Juuti P.S., K. T., Vuorinen, H.

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14501
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Part III: Modern urban infrastructure. Introduction

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P., Katko, T., Vuorinen, H.
Pages: 265-269
Publication date: 2007

Host publication information
Title of host publication: Environmental History of Water - Global views on community water supply and sanitation
Editors: Juuti, P., Katko, T., Vuorinen, H.

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14491
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Part II: Period of Slow Development. Ch 8. Introduction: pp. 99-102. Conclusions

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P. S., Katko, T. S., Vuorinen, H. S.
Number of pages: 4
Pages: 99-102
Publication date: 2007

Host publication information
Title of host publication: 2007. Environmental History of Water - Global views on community water supply and sanitation. IWA Publishing
Editors: Juuti P.S., K. T., Vuorinen, H.

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14499
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Part V: Comparative Analysis of the Omnipresent Water Fountains

General information
Publication status: Published
MoE publication type: B2 Part of a book or another research book
Organisations: School of Architecture, Department of Chemistry and Bioengineering, Former organisation of the author
Contributors: Hynynen, A. J., Juuti, P. S., Katko, T. S.
Pages: 137-212
Publication date: 2012

Host publication information
Title of host publication: Water Fountains in the Worldscape
Place of publication: Kangasala
Publisher: International Water History Association and Kehrämedia Inc.
Editors: Ari, J. H., Petri, S. J., Tapio, S. K.
ISBN (Print): 978-951-98151-8-3

Bibliographical note
Ei UT-numeroa 14.8.2013
Contribution: organisation=ark ays,FACT1=0.5
Contribution: organisation=keb bio,FACT2=0.5
Source: researchoutputwizard
Source ID: 4280
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific

Perfusion characterization using flow simulations and µPIV measurements

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Automation Science and Engineering, Department of Energy and Process Engineering
Contributors: Kreutzer, J., Honkanen, M., Laaksonen, J., Kallio, P.
Number of pages: 9
Pages: 1-9
Publication date: 2010

Host publication information
Title of host publication: Proceedings of the 2nd European Conference on Microfluidics - Microfluidics 2010, Toulouse, December 8-10, 2010
ISBN (Print): 978-2-906831-85-8

Bibliographical note
poistettu tupla r=3190
Contribution: organisation=ase aci,FACT1=0.5
Contribution: organisation=epr,FACT2=0.5
Source: researchoutputwizard
Source ID: 8467
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Physical symptoms in young adults and their use of different computers and mobile phones

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L., Pääkkönen, R.
Pages: 361-371
Publication date: 2011
Peer-reviewed: Yes

Publication information
Journal: International Journal of Occupational Safety and Ergonomics
Volume: 17
Issue number: 4
ISSN (Print): 1080-3548
Ratings:

Scopus rating (2011): CiteScore 0.7 SJR 0.274 SNIP 0.579
Original language: English

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 6421
Research output: Contribution to journal › Article › Scientific › peer-review

Pintavedestä pohjaveteen ja tekopohjaveteen

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering
Contributors: Katko, T.
Pages: 236-311
Publication date: 2010

Host publication information
Title of host publication: Näkymätönt Porrii. Porin Veden historia
Editors: Juuti, P., Katko, T., Louekari, S., Rajala, R.

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 8311
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Planning land use for biogas energy crop production: The potential of cutaway peat production lands
Each year, thousands of hectares of peatland that had been harvested are being released in Finland, which can offer an opportunity to increase energy crops and attain the bioenergy targets for non-agriculture lands. In this study, the Geographic Information System (GIS) method was used to improve the assessment of decentralized renewable energy resources. The amount of peat production lands and future cutaway areas for energy crop production was calculated as a case study by using ArcGIS and the Finnish Topographic database. There are almost 1000 km^2 of peat production lands in Finland, and theoretically, approximately 300 km^2 of cutaway peatlands could be used for energy crops after 30 years. The dry biomass yield of reed canary grass (Phalaris arundinacea) or timothy-fescue grass (mix of Phleum pratense and Festuca pratensis) could be higher than 100 Gg a^{-1} in these lands indicating methane potential of approximately 300 GWh. The exhausted peat production areas in the western region of Finland have significant potential for use for energy crops; North and South Ostrobothnia account for almost 45% of the total peat production land. A future goal could be to use the cutaway peat production lands more efficiently for bioenergy to mitigate climate change. Since the use of wastelands (including peatlands) are being considered in Europe as a way to avoid competition with food production, the GIS method used in the study to identify suitable peat lands could be applicable to biomass resource studies being conducted in many countries.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, University of Jyväskylä
Contributors: Laasasenaho, K., Lensu, A., Rintala, J.
Number of pages: 8
Pages: 355-362
Publication date: 1 Feb 2016
Peer-reviewed: Yes

Publication information
Journal: Biomass & Bioenergy
Volume: 85
ISSN (Print): 0961-9534
Ratings:

Scopus rating (2016): CiteScore 6.4 SJR 1.198 SNIP 1.411
Original language: English
ASJC Scopus subject areas: Agronomy and Crop Science, Forestry, Renewable Energy, Sustainability and the Environment, Waste Management and Disposal

Keywords: Bioenergy, Festuca pratensis, GIS, Phalaris arundinacea, Phleum pratense, Wasteland
DOIs:
10.1016/j.biombioe.2015.12.030

Bibliographical note
EXT="Laasasenaho, Kari"
Source: Scopus
Source ID: 84953292007
Research output: Contribution to journal › Article › Scientific › peer-review

Plasma-Assisted Fabrication of Fe2O3 - Co3O4 Nanomaterials as Anodes for Photoelectrochemical Water Splitting
Nanocomposite Fe2O3?Co3O4 photoanodes for photoelectrochemical H2O splitting were prepared by a plasma-assisted route. Specifically, Fe2O3 nanostructures were grown by plasma enhanced-chemical vapor deposition, followed by cobalt sputtering for different process durations. The systems were annealed in air after, or both prior and after, sputtering of Co, to analyze the treatment influence on functional performances. The interplay between processing conditions and chemico-physical features was investigated by a multi-technique characterization. Photocurrent density measurements in sunlight-assisted H2O splitting revealed a performance improvement upon Co3O4 loading. A cathodic shift of the onset potential was also observed, highlighting Co3O4 activity as catalyst for the oxygen evolution reaction.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Supramolecular photochemistry
Contributors: Carraro, G., Maccato, C., Gasparotto, A., Kaunisto, K., Sada, C., Barreca, D.
Number of pages: 10
Pages: 191-200
Publication date: 1 Jan 2016
Peer-reviewed: Yes
Early online date: 2015

Publication information
Journal: Plasma Processes and Polymers
Volume: 13
Issue number: 1
ISSN (Print): 1612-8869
Ratings:
Scopus rating (2016): CiteScore 4.7 SJR 0.881 SNIP 0.915
Original language: English
Keywords: Co3O4, Fe2O3, plasma-enhanced chemical vapor deposition (PE-CVD), sputtering, water splitting
DOIs:
10.1002/ppap.201500106
Source: Bibtex
Source ID: urn:fea2caf64465a2349fed5a21683d16de
Research output: Contribution to journal › Article › Scientific › peer-review

Pohjavesi, meidän vesi

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Civil Engineering
Contributors: Rajala, R.
Pages: 110-147
Publication date: 2010

Host publication information
Title of host publication: Hyvän veden ja hyvien yhteyksien kaupunki : Riihimäen Veden historia
Publisher: TamPub
Editors: Juuti, P., Rajala, R., Pietilä, P., Katko, T.
ISBN (Print): 978-952-5571-29-5
ISBN (Electronic): ISBN 978-951-44-8136-9
URLs:
http://urn.fi/urn:isbn:978-951-44-8136-9
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Pohjoismaiden energiapolitiikka 2030: Hiilineutraalimpaan energiajärjestelmään osin yhdessä, osin eri polkuja pitkin

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Department of Civil Engineering, Department of Electrical Engineering, Department of Chemistry and Bioengineering, Department of Physics, Research group: Capacity Development of Water and Environmental Services CADWES, University of Tampere, VTT, Tampere University of Applied Science
Contributors: Aalto, P., Harsia, P., Heljo, V., Holttinen, H., Jaakkola, I., Järventausta, P., Kirkinen, J., Kojo, M., Konttinen, J., Oksa, A. M., Rönkkö, T., Sorri, J., Toivanen, P.
Number of pages: 23
Publication date: 2016

Publication information
ISBN (Electronic): 978-952-03-0209-2

Publication series
Name: EL-TRAN analyysi
Volume: 4/2016
Keywords: Energy policy, Energy system, Carbon footprint
URLs:
https://tt.eduuni.fi/sites/EL-TRAN/Julkiset%20tiedostot/Pami%20Aalto%20et%20al,%20Pohjoismainen%20energiapolitiikka%202030%20--%20hiilineutraalimpaan%20energiaj%C3%A4rjestelm%C3%A4%C3%A4n.pdf
Research output: Working paper › Discussion paper › Professional

"Poika, nyt lähdettiin hommiin" - vesilaitos syntyy

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: University of Tampere
Contributors: Juuti, P.
Pages: 64-109
Publication date: 2010

Host publication information
Title of host publication: Hyvän veden ja hyvien yhteyksien kaupunki : Riihimäen Veden historia
Publisher: TamPub
Editors: Juuti, P., Rajala, R., Pietilä, P., Katko, T.
ISBN (Print): 978-952-5571-29-5
ISBN (Electronic): 978-951-44-8136-9
URLs:
http://urn.fi/urn:isbn:978-951-44-8136-9
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Pollutants source control and health effects

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Kelishadi, R., Amin, M. M., Haghdoost, A. A., Gupta, A. K., Tuhkanen, T. A.
Number of pages: 2
Pages: 1-2
Publication date: 2013
Peer-reviewed: Yes

Publication information
Journal: Journal of Environmental and Public Health
Volume: 2013
Article number: 209739

ISSN (Print): 1687-9805
Ratings:

Scopus rating (2013): CiteScore 1.9 SJR 0.638 SNIP 0.925
Original language: English
DOIs:

10.1155/2013/209739

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-12-29
Publisher name: Hindawi
Source: researchoutputwizard
Source ID: 2539
Research output: Contribution to journal › Article › Scientific › peer-review

Possible Impact of Long and Heavy Vehicles in the United Kingdom—A Commodity Level Approach

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Civil Engineering, Heriot-Watt University
Contributors: Liimatainen, H., Greening, P., Dadhich, P., Keyes, A.
Number of pages: 19
Publication date: 4 Aug 2018
Peer-reviewed: Yes

Publication information
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Volume: 10
Issue number: 8
ISSN (Print): 2071-1050
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Original language: English
Electronic versions:

sustainability-10-02754
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URLs:

http://urn.fi/URN:NBN:fi:tty-201808142159
Research output: Contribution to journal › Article › Scientific › peer-review

Power generation in fed-batch and continuous up-flow microbial fuel cell from synthetic wastewater
Up-flow bioreactors have the advantages of retaining very high cell density and having high mass transfer efficiency. The recirculation rate could improve the up-flow rate in up-flow bioreactor. A two-chamber UFMFC (up-flow microbial fuel cell) is constructed with flat graphite electrodes and anion exchange membrane for electricity generation. The anode chamber is seeded with compost culture enriched on xylose and operated on synthetic wastewater with 0.5 g/L xylose, external resistance of 100 Ω, at pH 7.0 and 37 °C in fed-batch mode. The cathode chamber in the top of the UFMFC is filled with potassium ferricyanide (pH 7.0) as the electron acceptor. The effects of different recirculation rates of 1.2, 2.4, 4.8 and 7.2 RV (reactor-volumes)/h to increase the mass transfer and electricity production are determined in fed-batch mode. At a recirculation rate of 4.8 RV/h, a power density of 356 ± 24 mW/m^2 with CE (coulombic efficiency) of 21.3 ± 1.0% is obtained. Decreasing HRT (hydraulic retention time) could improve the electricity production performance of UFMFC in continuous mode. The power generation is increased to 372 ± 20 mW/m^2, while CE remains at 13.4 ± 0.5% with HRT of 1.7 d and optimum recirculation rate of 4.8 RV/h on continuous mode. Microbial communities were characterized with PCR (polymerase chain reaction) - DGGE (denaturing gradient gel electrophoresis). In the end of the experiment, the biofilm contained both fermenting and exoelectrogenic bacteria, while fermenting and nitrate-reducing bacteria were mainly present in the anodic solutions. Moreover, some changes occurred in the microbial communities of the anodic solutions when the MFCs were switched from fed-batch to continuous mode, while the differences were minor between different recirculation rates in fed-batch mode.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Urban circular bioeconomy (UrCirBio)

Contributors: Lay, C., Kokko, M. E., Puhakka, J. A.
Number of pages: 7
Pages: 235-241
Publication date: 1 Nov 2015
Peer-reviewed: Yes

Publication information
Journal: Energy
Volume: 91
ISSN (Print): 0360-5442
Ratings:

Scopus rating (2015): CiteScore 7.4 SJR 2.22 SNIP 2.027
Original language: English
ASJC Scopus subject areas: Energy(all), Pollution
Keywords: Continuous mode, Microbial fuel cell, Recirculation rate, Two chamber, Up-flow, Xylose
DOIs:

10.1016/j.energy.2015.08.029
URLs:

http://www.scopus.com/inward/record.url?scp=84946031190&partnerID=8YFLogxK (Link to publication in Scopus)
Source: Scopus
Source ID: 84946031190
Research output: Contribution to journal › Article › Scientific › peer-review

Preferential adsorption of Cu in a multi-metal mixture onto biogenic elemental selenium nanoparticles
Preferential adsorption of Cu contained in wastewaters is desirable as the Cu can then be reprocessed and reused more easily. In this study, biogenic elemental selenium nanoparticles (BioSeNPs) were assessed for their ability to preferentially adsorb Cu from an equimolar mixture containing Cu, Cd and Zn. Variations in metal to BioSeNPs ratios and initial metal solution pH improved the preferential adsorption capacity of BioSeNPs toward Cu, with the ratio of Cu adsorbed to combined Cd and Zn adsorbed varying from 2.3 to 6.6. More than 78% of the added Cu was adsorbed at an initial metal solution pH of 5.2 and metal to BioSeNPs ratio of 0.21mgmg^{-1} when the ratio of Cu adsorbed to the sum of Cd and Zn adsorbed was 2.3. Infrared spectroscopy revealed that the Cu, Cd and Zn were interacting with the hydroxyl and carboxyl surface functional groups of the BioSeNPs. The modeling of BioSeNPs' acid-base titration revealed the presence of high concentrations of carboxylic groups (C=60.3molkg^{-1}) with a pK_a of 3.9, providing further evidence of their interaction with Cu. The adsorption of Cu resulted in a lower colloidal stability of the BioSeNPs as indicated by more than 99% retention of added BioSeNPs after adsorption of heavy metals and filtration. BioSeNPs showed a good preferential adsorption capacity toward Cu as compared to other adsorbent. This study provides a proof-of-concept for the preferential adsorption of Cu onto BioSeNPs which are present in the effluent of a bioreactor treating selenium oxyanions containing wastewater.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Tampere University of Technology, Research group: Industrial Bioengineering and Applied Organic Chemistry, Université Paris-Est
Contributors: Jain, R., Dominic, D., Jordan, N., Rene, E. R., Weiss, S., van Hullebusch, E. D., Hübner, R., Lens, P. N. L.
Pages: 917–925
Publication date: 2016
Peer-reviewed: Yes
Early online date: 2015

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Journal: Chemical Engineering Journal
Volume: 284
ISSN (Print): 1385-8947
Ratings:

Scopus rating (2016): CiteScore 9.7 SJR 1.758 SNIP 1.952
Original language: English
ASJC Scopus subject areas: Chemical Engineering(all), Chemistry(all), Industrial and Manufacturing Engineering, Environmental Chemistry
Keywords: Biogenic, Copper, FT-IR, Heavy metals, Preferential adsorption, Selenium nanoparticles
DOIs:

10.1016/j.cej.2015.08.144
Source: Scopus
Source ID: 84942540702
Research output: Contribution to journal › Article › Scientific › peer-review

Privatisation of water services in historical context, Mid-1800s to 2004

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Bio- ja ympäristötekniikka, Former organisation of the author
Contributors: Juuti, P., Katko, T., Hukka, J.
Pages: 235-257
Publication date: 2007

Host publication information
Title of host publication: Environmental History of Water - Global views on community water supply and sanitation
Editors: Juuti, P., Katko, T., Vuorinen, H.

Bibliographical note
Contribution: organisation=bio,FACT1=1
Source: researchoutputwizard
Source ID: 14487
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Production of Electricity and Butanol from Microalgal Biomass in Microbial Fuel Cells

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Urban circular bioeconomy (UrCirBio)
Contributors: Lakaniemi, A., Tuovinen, O. H., Puhakka, J. A.
Pages: 481-491
Publication date: 2012
Peer-reviewed: Yes

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Journal: BioEnergy Research
Volume: 5
Issue number: 2
ISSN (Print): 1939-1234
Ratings:

Scopus rating (2012): CiteScore 4.5 SJR 1.349 SNIP 1.668
Original language: English
DOIs:

10.1007/s12155-012-9186-2

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Publisher name: Springer New York LLC
Source: researchoutputwizard
Source ID: 4645
Research output: Contribution to journal › Article › Scientific › peer-review

Production of Oleaginous Microbial Biomass by Reusing Wastewaters
Global energy demand continues to increase, which raises the question regarding how to solve the energy crisis caused by diminishing fossil fuels. There is no single alternative energy source that could substitute the fossil fuels, but microbial single cell oils (SCO) could be part of the solution. SCOs can be produced by cultivating microorganisms in wastewater in which nutrients and carbon from the wastewater are used for biomass production. In optimized conditions, microorganisms begin to accumulate lipids, and these lipids can be further refined for the production of biodiesel or renewable diesel. The lipid accumulation of the microorganisms may be enhanced by culturing the microorganisms under stressful conditions. The most commonly used strategy for enhancing lipid accumulation is nitrogen starvation, but it is even more effective when combined with another stress factor, such as moderately increased salinity. In microbial lipid production, the major cost factor is often the substrate needed for the microorganisms. Therefore, utilizing inexpensive substrates and waste materials for the cultivation of oleaginous microorganisms is very desirable. Various wastewaters from municipalities, agriculture, and industrial sources have been studied, and many of these wastewaters have shown the potential for lipid-rich biomass production. Unfortunately, most of the studies have been conducted using sterilized wastewater. In large-scale applications, the sterilization of the wastewater is not cost-effective; therefore, lipid-accumulating microorganisms able to compete with the indigenous microorganisms of the wastewater need to be further studied. The aim of this work was to sustainably produce oleaginous biomass by reusing the carbon and nutrients from wastewaters. This work included

an evaluation of the suitability of various wastewaters for lipid-lipid rich biomass production (Paper I), the isolation of yeasts and fungi, which could possibly accumulate lipids by utilizing wastewater as substrate (Paper II), and the determination of the ability of the isolated microorganisms to accumulate lipids by comparing them with known lipid accumulating yeasts (Paper II). Unlike yeasts and fungi, microalgae are able to use an inorganic carbon source for their growth. This feature enables the combination of wastewater and flue gas treatment. Therefore, the growth and lipid accumulation of three microalgal species were compared (Paper III), and the suitability of the most potential microalgal species for accumulating lipids in sterilized and non-sterilized wastewater was studied (Paper III & IV). Based on the results of this study, palm oil mill effluent (POME) has more potential for lipid production than chemithermomechanical pulp mill effluent (CTMP) or municipal wastewate r (MWW) (Paper I). The residual lipids and solids of POME obstructed the analyses of the microbial SCOs. Eukaryotes isolated from POME with agar plates were genetically identified as Candida silvae NRRL Y-6725 (with 100% similarity), Galactomyces geotrichum LMA-20 (with 99.8% similarity), Lecythophora hoffmannii CBS245.38T (with 96.7% similarity), and Graphium penicillioides JCM9300 (with 99.3% similarity) (Paper II). The fungus Graphium penicillioides had a great potential for lipid accumulation based on the comparison study with well-known oleaginous yeast strains (Yarrowia lipolytica DSMZ8212, Cryptococcus curvatus DSMZ70022, & Cryptococcus albidus DSMZ701097) in a synthetic medium (Paper II). The lipid content per dry weight was higher with G. penicillioides compared to C. curvatus after 15 days of incubation (29.1±3.0 wt% vs 20.2±2.9 wt%, Paper II). Unfortunately, the overall lipid concentration was lower due to a lower biomass concentration. G. penicillioides contained more than 20% lipids, so it can be called oleaginous. From the three microalgae isolated from a Taiwanese freshwater area (Chlorella sorokiniana CY1, Chlorella vulgaris CY5, & Chlamydomonas sp. JSC-04), C. vulgaris accumulated more lipids when various media, nitrogen sources, and nitrogen concentrations were studied (Paper III). The C. vulgaris in the BG-11 medium, initially containing 0.38 g $NaNO_3$/L, produced 3.8 g/L biomass and 57.5 wt% lipids after 12 days of incubation. The most suitable wastewater dilution for the lipid accumulation of C. vulgaris on sterilized anaerobically treated piggery wastewater was 5x dilution, which resulted in initial chemical oxygen demand and total Kjeldahl nitrogen of 75.4 mg/L and 57.4 mg/L, respectively. C. vulgaris was suitable for accumulating lipids on both sterilized and non-sterilized anaerobically treated piggery wastewater (PW) (Paper IV). The highest lipid content and productivity with the non-sterilized wastewater were rather promising (32.5±3.2 wt%, 71.2±2.2 g/L/d). However, under the conditions of these experiments, C. vulgaris excreted dissolved organic carbon (Paper III & IV), and the aim in wastewater treatment is the removal of organic carbon. In summary, this work demonstrates the potential of indigenous eukaryotic microorganisms for lipid-rich biomass production. G. penicillioides isolated from POME has the potential for lipid-rich biomass production in a synthetic medium, which has not been previously reported. Similarly, C. vulgaris has the potential for lipid-rich biomass production in non-sterilized piggery wastewater, while most of the studies in the literature on C. vulgaris and wastewater have been conducted using sterilized wastewater. To enable simultaneous accumulation of lipids and efficient treatment of wastewater, special attention should be focused on the growth conditions.

General information
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MoE publication type: G5 Doctoral dissertation (article)
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Contributors: Marjakangas, J.
Number of pages: 58
Publication date: 28 Nov 2015

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Original language: English

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Publisher: Tampere University of Technology
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Electronic versions:

marjakangas_1348
URLs:

http://URN.fi/URN:ISBN:978-952-15-3632-8

Bibliographical note
Awarding institution:Tampere University of Technology
Research output: Book/Report › Doctoral thesis › Collection of Articles

Prologue

General information
Publication status: Published
MoE publication type: C2 Edited books
Organisations: Former organisation of the author
Contributors: Juuti, P. S. (ed.), Katko, T. S. (ed.), Schwartz, K. (ed.)
Number of pages: 3
Publication date: 2013

Publication information
Publisher: IWA Publishing
ISBN (Print): 978-1-78040-022-8
ISBN (Electronic): 978-1-78040-073-0
Original language: English

Bibliographical note
Epilogue r=1592
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-09-29
Source: researchoutputwizard
Source ID: 2442
Research output: Book/Report › Anthology › Scientific › peer-review

Pt-functionalized Fe2O3 photoanodes for solar water splitting: the role of hematite nano-organization and the platinum redox state
Pt/alpha-Fe2O3 nanocomposites were synthesized on fluorine-doped tin oxide (FTO) substrates by a sequential plasma enhanced-chemical vapor deposition (PE-CVD)/radio frequency (RF) sputtering approach, tailoring the overall Pt content as a function of sputtering time. The chemico-physical properties of the as-prepared systems were extensively investigated by means of complementary techniques, including X-ray diffraction (XRD), X-ray photoelectron spectroscopy (XPS), field emission-scanning electron microscopy (FE-SEM), energy dispersive X-ray spectroscopy (EDXS), secondary ion mass spectrometry (SIMS), and optical absorption spectroscopy, and compared to those of the homologous Pt/alpha-Fe2O3 systems annealed in air prior and/or after sputtering. The obtained results evidenced that the material compositional, structural and morphological features, with particular regard to the Pt oxidation state and hematite nano-organization, could be finely tailored as a function of the adopted processing conditions. Pt/alpha-Fe2O3 systems were finally tested as photoanodes in photoelectrochemical (PEC) water splitting experiments, evidencing a remarkable interplay between functional performances and the above-mentioned material properties, as also testified by transient absorption spectroscopy (TAS) results.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Supramolecular photochemistry, Univ Padua, University of Padua, Dept Chem, INSTM, Univ Padua, University of Padua, Dept Chem, CNR IENI, Univ Brescia, University of Brescia, Chem Technol Lab, Univ Padua, University of Padua, Dept Phys & Astron, Univ Padua, University of Padua, INSTM, Dept Chem, Univ Cologne, University of Cologne, Dept Chem, Chair Inorgan & Mat Chem
Contributors: Warwick, M. E. A., Barreca, D., Bontempi, E., Carraro, G., Gasparotto, A., Maccato, C., Kaunisto, K., Ruoko, T. -., Lemmetyinen, H., Sada, C., Goenuellue, Y., Mathur, S.
Number of pages: 9
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Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Physical Chemistry Chemical Physics
Volume: 17
Issue number: 19
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Ratings:

Scopus rating (2015): CiteScore 6.6 SJR 1.725 SNIP 1.188
Original language: English
Keywords: ALPHA-FE2O3 THIN-FILMS, PHOTOELECTROCHEMICAL PERFORMANCE, NANOSTRUCTURED ALPHA-FE2O3, HYDROTHERMAL METHOD, WATER OXIDATION
Electronic versions:

Pt-functionalized_pre-print
DOIs:

10.1039/c5cp01636c
URLs:

http://urn.fi/URN:NBN:fi:tty-201612024838

Source: WOS
Source ID: 000354195300053
Research output: Contribution to journal › Article › Scientific › peer-review

Puurakenteiden uudelleenkäyttömahdollisuudet

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Civil Engineering, Research group: Service Life Engineering of Structures, Architecture, Research group: Built Environment in Transition
Contributors: Huuhka, S., Köliö, A., Annila, P., Poti, A.
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Publication date: Jan 2018

Publication information
Place of publication: Tampere
Publisher: Tampere University of Technology
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Original language: Finnish

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Name: Muuttuva rakennettu ympäristö
Publisher: Tampere University of Technology. Architecture.
No.: 4
ISSN (Electronic): 2489-4281
Name: Rakennetekniikka. Tutkimusraportti.
Publisher: Tampere University of Technology. Civil Engineering.
No.: 165
Electronic versions:

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URLs:

http://urn.fi/URN:ISBN:978-952-15-4075-2
Research output: Book/Report › Commissioned report › Professional

Radon, fungal spores and MVOCs reduction in crawl space house: A case study and crawl space development by hygrothermal modelling
In this case study was to investigate how ventilation of the crawl space will influence on concentrations of radon, fungal spores and MVOCs in the crawl space and indoors of detached house. The crawl space pressurisation by exhaust air from indoors was successful to prevent the convective flow of radon from the soil, but it increased microbial growth in the crawl space. After installation of the supply and exhaust ventilation in the crawl-space and in the living space, the concentrations of fungal spores in the crawl space and also entry of radon and MVOCs into a house decreased. A microbiologically safe crawl space was determined with hygrothermal simulation utilizing the Finnish Mould Growth Model and a two year examination period. The optional structures of the crawl space being depressurised with exhaust ventilation included an open base uncovered ground and various air-sealed closed structures. When mould growth of building materials was at medium resistant sensitivity class, mould was not observed during different air change rates in any of the examined structures. Open base uncovered gravel ground is a functional solution of a crawl space, only when there are no organic materials. The air-sealed ground structure is recommended build with concrete + insulation and when air exchange rate (ach) varied from 0.2 to 1 h^{-1}. A concrete ground in the crawl space having ach from 0.2 to 0.6 h^{-1} is also very effective. XPS insulation and plastic sheet covered ground are not recommendable due to their high mould index.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Civil Engineering, Ramboll Finland Ltd., Ita-Suomen yliopisto
Contributors: Keskikuru, T., Salo, J., Huttunen, P., Kokotti, H., Hyttinen, M., Halonen, R., Vinha, J.
Number of pages: 10
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Publication date: 15 Jun 2018
Peer-reviewed: Yes

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Volume: 138
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Scopus rating (2018): CiteScore 8.1 SJR 1.879 SNIP 2.241
Original language: English
ASJC Scopus subject areas: Environmental Engineering, Civil and Structural Engineering, Geography, Planning and Development, Building and Construction
Keywords: Air change, Crawl space, Ground covers, Modelling, Mould growth, Radon
Electronic versions:

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URLs:

http://urn.fi/URN:NBN:fi:tuni-201911186059. Embargo ended: 15/06/20

Bibliographical note
INT=rak,"Salo, J."
Source: Scopus
Source ID: 85046008041
Research output: Contribution to journal › Article › Scientific › peer-review

Rakennusten energiankulutuksen perusskenaario Suomessa 2015-2050
Ilmaston lämpenemistä aiheuttavista kasvihuonekaasupäästöistä noin 80 % on peräisin energian tuotannosta ja kulutuksesta (ml. liikenne), mikä tarkoittaa, että energia- ja ilmastopolitiikka ovat tiivis kokonaisuus. Vuonna 2016 Suomessa valmisteltiin uutta energia- ja ilmastostrategiaa, johon kuuluu myös skenaarioiden valmistelu. Tässä raportissa esitetty työ tukee strategian valmistelutyötä. Raportti jakaantuu kahteen osaan: rakennuskannan energiankäytön ennustamiseen ja puun pienpolton lisäämisen tarkasteluihin. Työssä tehtiin rakennustyypeittäin perusskenaarion mukainen tarkastelu, joka jatkaa tulevaisuuteen energiatilastojen lukuja vuodesta 2015 aina vuoteen 2050. Perusskenaariolla arvioidaan jo päätettyjen ja toimeenpantujen politiikkatoimien vaikutusta tulevaisuuden kehitykseen. Rakennuskannan energiankäytön osalta tehtiin ennuste peruskehityksestä ja lisäksi matalamman talouskasvun ennuste. Energiankulutus on esitetty sekä hankitun energian tasolla että hyötyenergiana. Varsinaisten asuinrakennusten (pientalot, rivi- ja ketjutalot, asuinkerrostalot) hankitun energian määrässä on pieni laskeva trendi, mutta energiantarve pysyy oleellisesti samalla tasolla tarkasteluajanjaksolla. Aurinkolämmön kehitykselle muodostettiin maltillinen lineaariseen kasvuun perustuva ennuste. Toiseksi työssä tarkasteltiin puun pienpolton lisäämisestä aiheutuvia pienhiukkaspäästöjä ja niiden vaikutusta väestöaltistukseen. Laskentaesimerkin perusteella voidaan todeta, että myös modernien, verrattain vähäpäästöisten varaavien takkojen kasvava käyttö lisää hengitysilman pienhiukkaspitoisuuksia.

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Department of Civil Engineering, Research group: Real estate development
Contributors: Mattinen, M., Heljo, J., Savolahti, M.
Number of pages: 66
Publication date: 13 Sep 2016

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Place of publication: Helsinki
Publisher: Suomen ympäristökeskus
ISBN (Electronic): 978-952-11-4644-2
Original language: Finnish

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Publisher: Suomen ympäristökeskus
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URLs:

https://helda.helsinki.fi/handle/10138/166673
Research output: Book/Report › Commissioned report › Professional

Rating the impact sound insulation of concrete floors with single-number quantities based on a psychoacoustic experiment
Impact sounds are different living sounds directed at floors in dwellings. Objective single-number quantities used in rating the impact sound insulation of floors and between dwellings have been presented in standard ISO 717-2 (2013). It has long been recognised that the standardised single-number quantities do not correlate well with the subjective judgement of

living impact sounds. The main objective of this thesis was to develop new single-number quantities that would correspond better with the subjective experience of living impact sounds transmitted from the neighbouring dwelling upstairs. New single-number quantities concern five different living impact sounds. In addition, the purpose was to develop a single-number quantity that explains the annoyance caused by all five impact living sounds. Experimental data for the development of the new single-number quantities was produced by measuring the impact sound insulation of concrete floors with a wide scale of floor coverings. Five spectrally different living impact sounds were also measured and recorded. These sounds were walking with socks, hard and soft shoes, super ball bouncing and chair moving. A psychoacoustic experiment with an extensive number of participants was conducted to find out the loudness and annoyance of the living impact sounds and, furthermore, the associations between the subjective judgement of the sounds and objective single-number quantities. The experimental data of the impact sound insulation measurements and the psychoacoustic experiment was utilised in mathematical optimisation of new single-number quantities. As a starting point for the formulation of the new single-number quantities, it was required for them to be able to be expressed as the sum of the present single-number quantity L'n,w or L'nT,w and a new spectrum adaptation term instead of CI or CI,50-2500. An optimised reference spectrum could be developed for each of the five sound types, each leading to a better correlation between the subjective judgement of the annoyance of the sounds and the single-number quantities than can be achieved by using any of the single-number quantities presented in the standard ISO 717-2. In addition, an optimised reference spectrum was derived which explained the annoyance of all five sound types reasonably well (coefficient of determination R2 = 0.93) and better than any of the standardised single number quantities (e.g. R2 = 0.86 for L'n,w + CI,50-2500). Another objective of the thesis was to study the measurement uncertainties of various single-number quantities for rating the impact sound insulation at a frequency range of 50 Hz and above. It was shown that the measurement uncertainty of a single-number quantity depends on the impact sound spectrum of the floor type. The results also indicate that the uncertainty depends on the extent that the single-number quantity weights the low frequencies. The measurement uncertainty at a low frequency range, however, does not become so large that it would prevent developing new reference curves that weight this frequency range more strictly than the present, standardised reference curves starting at 100 Hz.

General information
Publication status: Published
MoE publication type: G5 Doctoral dissertation (article)
Organisations: Civil Engineering, Research group: Building Acoustics
Contributors: Kylliäinen, M.
Number of pages: 80
Publication date: 29 Aug 2019

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ISSN (Electronic): 2490-0028
URLs:

http://urn.fi/URN:ISBN:978-952-03-1166-7
Research output: Book/Report › Doctoral thesis › Collection of Articles

Ravinnevisio: Selvitys Pirkanmaan puhdistamolietteiden ja biojätteiden ravinteista ja niiden potentiaalisesta käytöstä

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Natural Resources Institute Finland (Luke)
Contributors: Mönkäre, T., Kinnunen, V., Tampio, E., Ervasti, S., Lehtonen, E., Kettunen, R., Rasi, S., Rintala, J.
Number of pages: 56
Publication date: Jun 2016

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Original language: Finnish

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No.: 74
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Research output: Book/Report › Commissioned report › Professional

Recent advances in nutrient removal and recovery in biological and bioelectrochemical systems
Nitrogen and phosphorous are key pollutants in wastewater to be removed and recovered for sustainable development. Traditionally, nitrogen removal is practiced through energy intensive biological nitrification and denitrification entailing a major cost in wastewater treatment. Recent innovations in nitrogen removal aim at reducing energy requirements and recovering ammonium nitrogen. Bioelectrochemical systems (BES) are promising for recovering ammonium nitrogen from nitrogen rich waste streams (urine, digester liquor, swine liquor, and landfill leachate) profitably. Phosphorus is removed from the wastewater in the form of polyphosphate granules by polyphosphate accumulating organisms. Alternatively, phosphorous is removed/recovered as Fe-P or struvite through chemical precipitation (iron or magnesium dosing). In this article, recent advances in nutrients removal from wastewater coupled to recovery are presented by applying a waste biorefinery concept. Potential capabilities of BES in recovering nitrogen and phosphorous are reviewed to spur future investigations towards development of nutrient recovery biotechnologies.

General information
Publication status: Published
MoE publication type: A2 Review article in a scientific journal
Organisations: Department of Chemistry and Bioengineering
Contributors: Nancharaiah, Y. V., Venkata Mohan, S., Lens, P. N. L.
Pages: 173–185
Publication date: Sep 2016
Peer-reviewed: Yes

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Journal: Bioresource Technology
Volume: 215
ISSN (Print): 0960-8524
Ratings:

Scopus rating (2016): CiteScore 9.9 SJR 2.215 SNIP 1.945
Original language: English
ASJC Scopus subject areas: Bioengineering, Environmental Engineering, Waste Management and Disposal
Keywords: Microbial fuel cells, Nitrogen removal, Phosphorus removal, Waste biorefinery, Wastewater
DOIs:

10.1016/j.biortech.2016.03.129
Source: Scopus
Source ID: 84962019395
Research output: Contribution to journal › Review Article › Scientific › peer-review

Recycling mine tailings in chemically bonded ceramics - A review
Mine tailings account for most of the environmental incidents related to the extractive industry, with risks increasing due to steadily rising tonnage of low-grade ore and extreme weather events. Recycling of tailings in raw-material-intensive applications presents an interesting alternative to costly tailings management with associated restoration efforts. Chemically bonded ceramics may offer a route to upgrading mine tailings into raw materials for ceramics. In this review such chemically bonded ceramic methods that may be used to recycle mine tailings as raw materials, are reviewed while focusing in particular on two methods: 1) geopolymerization/alkali activation and 2) chemically bonded phosphate ceramics. The aim of the review is not to give exhaustive review on the wide topic, but to scope the required boundary conditions that need to be met for such utilization. According to the findings, alkali activation has been studied for 28 separate silicate minerals in the scientific literature, and presents a viable method, which is already in commercial use in calcium-rich cement-like binder applications. Phosphate bonding literature is more focused on phosphate containing minerals and waste encapsulation. Very little work has been done on low-calcium tailings utilization with either technology, and more knowledge is needed on the effect of different pre-treatment methods to increase reactivity of mine tailings in chemically bonded ceramics.

General information
Publication status: Published
MoE publication type: A2 Review article in a scientific journal
Organisations: Materials Science, Research group: Ceramic materials, University of Oulu, Geologian tutkimuskeskus

Contributors: Kinnunen, P., Ismailov, A., Solismaa, S., Sreenivasan, H., Räisänen, M., Levänen, E., Illikainen, M.
Pages: 634-649
Publication date: 2018
Peer-reviewed: Yes
Early online date: 26 Oct 2017

Publication information
Journal: Journal of Cleaner Production
Volume: 174
ISSN (Print): 0959-6526
Ratings:
Scopus rating (2018): CiteScore 8.7 SJR 1.62 SNIP 2.317
Original language: English
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10.1016/j.jclepro.2017.10.280
Research output: Contribution to journal › Review Article › Scientific › peer-review

Recycling potential of post-consumer plastic packaging waste in Finland

Recycling of plastics is urged by the need for closing material loops to maintain our natural resources when striving towards circular economy, but also by the concern raced by observations of plastic scrap in oceans and lakes. Packaging industry is the sector using the largest share of plastics, hence packaging dominates in the plastic waste flow. The aim of this paper was to sum up the recycling potential of post-consumer plastic packaging waste in Finland. This potential was evaluated based on the quantity, composition and mechanical quality of the plastic packaging waste generated by consumers and collected as a source-separated fraction, within the mixed municipal solid waste (MSW) or within energy waste.

Based on the assessment 86,000–117,000 tons (18 kg/person/a) of post-consumer plastic packaging waste was generated in Finland in 2014. The majority, 84% of the waste was in the mixed MSW flow in 2014. Due to the launching of new sorting facilities and separate collections for post-consumer plastic packaging in 2016, almost 40% of the post-consumer plastic packaging could become available for recycling. However, a 50% recycling rate for post-consumer plastic packaging (other than PET bottles) would be needed to increase the overall MSW recycling rate from the current 41% by around two percentage points.

The share of monotype plastics in the overall MSW plastics fraction was 80%, hence by volume the recycling potential of MSW plastics is high. Polypropylene (PP) and low density polyethylene (LDPE) were the most common plastic types present in mixed MSW, followed by polyethylene terephthalate (PET), polystyrene (PS) and high density polyethylene (HDPE). If all the Finnish plastic packaging waste collected through the three collection types would be available for recycling, then 19,000–25,000 tons of recycled PP and 6000–8000 tons of recycled HDPE would be available on the local market. However, this assessment includes uncertainties due to performing the composition study only on mixed MSW plastic fraction. In order to obtain more precise figures of the recycling potential of post-consumer plastic packaging, more studies should be performed on both the quantities and the qualities of plastic wastes.

The mechanical and rheological test results indicated that even plastic wastes originating from the mixed MSW, can be useful raw materials. Recycled HDPE showed a smaller decline in the mechanical properties than recycled PP. The origin and processing method of waste plastic seemed to have less effect on the mechanical quality than the type of plastic. The applicability of a plastic waste for a product needs to be assessed case by case, due to product specific quality requirements. In addition to mechanical properties, the chemical composition of plastic wastes is of major importance, in order to be able to restrict hazardous substances from being circulated undesirably.

In addition to quantity and quality of plastic wastes, the sustainability of the whole recycling chain needs to be assessed prior to launching operations so that the chain can be optimized to generate both environmental and economic benefits to society and operators.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Materials Science
Contributors: Dahlbo, H., Poliakova, V., Mylläri, V., Sahimaa, O., Anderson, R.
Pages: 52-61
Publication date: 2018
Peer-reviewed: Yes
Early online date: 31 Oct 2017

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Journal: Waste Management

Volume: 71
ISSN (Print): 0956-053X
Ratings:

Scopus rating (2018): CiteScore 8.2 SJR 1.523 SNIP 2.232
Original language: English
DOIs:

10.1016/j.wasman.2017.10.033
Research output: Contribution to journal › Article › Scientific › peer-review

Reducing CO2 emissions from freight: Recent developments in freight transport in the Nordic countries and instruments for CO2 reductions

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Civil Engineering, Research group: Transport Research Centre Verne
Contributors: Pinchasik, D., Hovi, I. B., Vierth, I., Mellin, A., Liimatainen, H., Kristensen, N.
Number of pages: 129
Publication date: 2018

Publication information
Publisher: NORDIC COUNCIL OF MINISTERS
ISBN (Print): 978-92-893-5901-6
ISBN (Electronic): 978-92-893-5902-3
Original language: English

Publication series
Name: Temanord
ISSN (Print): 0908-6692
DOIs:

10.6027/TN2018-554
Research output: Book/Report › Commissioned report › Professional

Reduction of combustion-generated emissions by means of multiobjective optimization and computational fluid dynamics

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Oksanen, A., Saario, A. J.
Number of pages: 17
Pages: 1-17
Publication date: 2011

Host publication information
Title of host publication: CFD & Optimization 2011, Methods and Applications, ECCOMAS Thematic Conference, 23-25 May 2011, Antalya, Turkey
Place of publication: Antalya
Publisher: ECCOMAS
ISBN (Print): 978-605-61427-4-1

Publication series
Name: ECCOMAS Thematic Conference on CFD & Optimization, Methods and Applications
Publisher: ECCOMAS

Bibliographical note
ei ut-numeroa 26.4.2014
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 6920
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Relevance of the resilience concept and long-term thinking for WSS providers

General information

Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Research group: Capacity Development of Water and Environmental Services CADWES, Civil Engineering
Contributors: Juuti, P., Mattila, H., Rajala, R., Schwartz, K., Staddon
Number of pages: 10
Pages: 227-236
Publication date: 2019

Host publication information
Title of host publication: Resilient Water Services and Systems: The Foundation of Well-Being. IWA Publishing
Publisher: IWA Publishing
ISBN (Print): 9781780409764
ISBN (Electronic): 9781780409771
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Removal of odours in dry toilets by biofiltration

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Chemistry and Bioengineering
Contributors: Palmroth, M., Kolha, V., Ramos Garcia, A., Perrier, L., Richter, C., Tuhkanen, T.
Number of pages: 4
Pages: 1-4
Publication date: 2012

Host publication information
Title of host publication: ECO STP, EcoTechnologies for Wasterwater Treatment, Technical, Environmental & Economic Challenges, Santiago de Compostela, Spain, 25-27 June 2012
Publisher: International Water Association IWA
ISBN (Print): 978-84-695-3605-6

Publication series
Name: EcoTechnologies for Wasterwater Treatment, IWA International Conference

Bibliographical note
ei ut-numeroa 27.8.2013
Contribution: organisation=keb bio,FACT1=1
Publisher name: International Water Association IWA
Source: researchoutputwizard
Source ID: 5010
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Replacing centralised waste and sanitation infrastructure with local treatment and nutrient recycling: Expert opinions in the context of urban planning
Solutions for resource scarcity should be sought from urban waste management and sanitation, which are characterised by central plants and long networks. The socio-technical transition to more sustainable infrastructure is expected to include partial decentralisation based on local conditions. This paper focuses on drivers, barriers and enablers in implementing a decentralised circular system in a new residential area (Tampere, Finland). In the alternative system, biowaste and feces are treated in a local biogas plant, and nutrient and energy output are utilised within the area. This research aims to understand what kind of urban planning enables alternative infrastructure, as well as the characteristics of an innovation capable of making a breakthrough. Seventeen infrastructure planning experts were interviewed, then assembled to re-develop ideas arising from the interviews. Based on these qualitatively analysed data, 11 factors which help the adoption of the alternative system were formulated. The results indicate that sustainability transition can be facilitated through impartial urban planning that allows the early participation of actors and improved communications. Additionally, studying the impact of alternative solutions and city guidance according to environmental policy aims may enhance transition. Innovation success factors include suitable locations, competent partners, mature technology and visible local benefits.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Contributors: Särkilahti, M., Kinnunen, V., Kettunen, R., Jokinen, A., Rintala, J.
Pages: 195-204
Publication date: 2017

Peer-reviewed: Yes
Early online date: 21 Feb 2017

Publication information
Journal: Technological Forecasting and Social Change
Volume: 118
ISSN (Print): 0040-1625
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Scopus rating (2017): CiteScore 5.8 SJR 1.38 SNIP 1.744
Original language: English
ASJC Scopus subject areas: Business and International Management, Applied Psychology, Management of Technology and Innovation
Keywords: Alternative sanitation, Biogas, Nutrient recycling, Socio-technical transition, Tampere, Urban land-use planning
DOIs:

10.1016/j.techfore.2017.02.020
Source: Scopus
Source ID: 85013157702
Research output: Contribution to journal › Article › Scientific › peer-review

Requirements for rainfall retention and strorage in cold climate

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Chemistry and Bioengineering
Contributors: Inha, L., Paavilainen, P., Pietilä, P., Katko, T.
Pages: 343-349
Publication date: 2010

Host publication information
Title of host publication: Conference Proceedings. IWRM Integrated Water Resources Management, 24-25 November 2010, Karlsruhe
Editor: Steusloff, H.

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 8156
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Resiliency is the key for sustainable water services.

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Research group: Capacity Development of Water and Environmental Services CADWES, Civil Engineering
Contributors: Juuti, P., Mattila, H., Rajala, R., Schwartz, K., Staddon, C.
Number of pages: 8
Pages: 1-8
Publication date: 2019

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Title of host publication: Resilient Water Services and Systems: The Foundation of Well-Being. IWA Publishing
Publisher: IWA Publishing
ISBN (Print): 9781780409764
ISBN (Electronic): 9781780409771
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Resilient Asset Management and Governance Fordeteriorating Water Services Infrastructure
This paper argues that strategic asset management and a sound regulatory regime are required urgently if we want to change the current paradigm of aging and decaying water services infrastructure and expand the coverage of improved water services in the developing economies. In the OECD countries access to safe water supply and sanitation has largely been ensured through substantial investment over many decades. Yet, significant investments will still be required to rehabilitate the existing infrastructures, to bring them into conformity with more stringent environmental and health regulations, and to maintain service quality in the future. In the non-OECD countries the challenges are more daunting.

Large parts of their population have no access and many suffer from unsatisfactory services. Nearly one billion people lack access to clean drinking water and 2.6 billion people lack access to improved sanitation services.Lack of sound economic regulatory frameworks and enforcement regimes, and poor asset management practices, in particular underpricing of water services is a common problem throughout the world.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Department of Chemistry and Bioengineering
Contributors: Hukka, J. J., Katko, T. S.
Number of pages: 8
Pages: 112-119
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Procedia Economics and Finance
Volume: 21
ISSN (Print): 2212-5671
Original language: English
Keywords: aging and deteriorating water services infrastructure, investment gap, strategic asset management, regulatory and enforcement framework, sustainability.
DOIs:
10.1016/S2212-5671(15)00157-4
Source: RIS
Source ID: urn:B63C341C3AC1323B613E64632E9D1135
Research output: Contribution to journal › Article › Scientific › peer-review

Resilient Water Services and Systems: The Foundation of Well-Being

General information
Publication status: Published
MoE publication type: C2 Edited books
Organisations: Research group: Capacity Development of Water and Environmental Services CADWES, Civil Engineering , HAMK University of Applied Sciences
Contributors: Juuti, P. (ed.), Mattila, H. (ed.), Rajala, R. (ed.), Schwartz, K. (ed.), Staddon, C. (ed.)
Publication date: 2019

Publication information
Publisher: IWA Publishing
ISBN (Print): 9781780409764
Original language: English
Research output: Book/Report › Anthology › Scientific › peer-review

Revisiting cellulase production and redefining current strategies based on major challenges Article reference: RSER5103
Lignocellulosic biomass has been considered as an important and sustainable source of renewable energy. Cellulose constitutes the major component of the lignocellulosic biomass and also offers maximum recalcitrance towards its fullest utilization. The enzymatic breakdown of cellulose is achieved through cellulases. Diverse forms of microbes including fungi, bacteria, actinomycetes and yeast are known to produce cellulases that have found extensive application in various industries. Due to the current global political unrest over oil prices and the threat of global warming following combustion of fossil fuels, the paradigm of research is now focused on biofuel production from plant biomass. Conventional approaches have not been economically feasible for meeting the demands of the industry. This review provides an update regarding the status of present microbial cellulase production technologies and research with special reference to solid state fermentation and different molecular techniques such as mutagenesis, metabolic engineering and heterologous gene expression of cellulases from different microbial domains with improved catalytic and stability properties. Metagenomic and genomic studies for mining of novel cellulase genes in addition to screening of culturable strains using conventional methods have been advanced. In addition the bottlenecks associated with cellulase production and how the future research needs to be directed to provide a comprehensive technology for the production of cellulases with novel traits for application at an industrial level without economic constraints are discussed.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry

Contributors: Kuhad, R. C., Deswal, D., Sharma, S., Bhattacharya, A., Kumar Jain, K., Kaur, A., Pletschke, B. I., Singh, A. , Karp, M.
Number of pages: 24
Pages: 249-272
Publication date: 2016
Peer-reviewed: Yes

Publication information
Journal: Renewable and Sustainable Energy Reviews
Volume: 55
ISSN (Print): 1364-0321
Ratings:

Scopus rating (2016): CiteScore 12.9 SJR 2.998 SNIP 3.543
Original language: English
DOIs:

10.1016/j.rser.2015.10.132
Research output: Contribution to journal › Article › Scientific › peer-review

Revisiting the feasibility of biomass-fueled CHP in future energy systems – Case study of the Åland Islands
Biomass has been widely recognized as a sustainable fuel for balancing energy systems with high amounts of varying renewable energy production, mainly from wind or solar power. Combined heat and power (CHP) is an efficient technology for biomass utilization and energy system balancing. Currently, the increasing amount of renewable power production often reduces the price of electricity, which makes CHP plants uneconomical. However, this might not be the case in the future, when the subsidies for developing renewable energy sources are reduced or removed. This paper presents a feasibility analysis of the potential for operational flexibility in a bio-fueled CHP plant in a real-life environment using a spreadsheet model. Three different renewable power production schemes for the Åland Islands were analyzed: the present system, a balanced scenario and a high-wind scenario. The analysis was conducted for three different-sized CHP plants run in modes which followed either the heat or the power load. Moreover, in one case two more parameters affecting the magnitude and rate of the flexibility were thoroughly examined: the start-up time and the minimum plant load. The results showed that biomass does have a place in future energy systems, and the spreadsheet tool can effectively be used for a CHP feasibility assessment in different operational environments; both for existing CHP plants and for planning new investments. The results indicate that the availability of inexpensive fuel and sufficient income from heat sales have to be secured as the operational environment of the CHP plant changes. The examination of the operational mode revealed that in the power-following mode, where the CHP plant can offer flexibility services, the plant's profitability depends on the rate of compensation for the excess heat or spinning hours.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Research group: Bio- and Circular Economy, Materials Science and Environmental Engineering, Valmet Technologies
Contributors: Pääkkönen, A., Joronen, T.
Pages: 66 - 75
Publication date: 15 May 2019
Peer-reviewed: Yes

Publication information
Journal: Energy Conversion and Management
Volume: 188
ISSN (Print): 0196-8904
Ratings:

Scopus rating (2019): CiteScore 13.6 SJR 2.924 SNIP 2.364
Original language: English
Keywords: Biomass, Operational flexibility, Bio-CHP profitability
DOIs:

10.1016/j.enconman.2019.03.057
Source: Bibtex
Source ID: PAAKKONEN201966
Research output: Contribution to journal › Article › Scientific › peer-review

Rewiring the wax ester production pathway of acinetobacter baylyi ADP1
Wax esters are industrially relevant high-value molecules. For sustainable production of wax esters, bacterial cell factories are suggested to replace the chemical processes exploiting expensive starting materials. However, it is well recognized that new sophisticated solutions employing synthetic biology toolbox are required to improve and tune the cellular production platform to meet the product requirements. For example, saturated wax esters with alkanol chain lengths C12

or C14 that are convenient for industrial uses are rare among bacteria. Acinetobacter baylyi ADP1, a natural producer of wax esters, is a convenient model organism for studying the potentiality and modifiability of wax esters in a natural host by means of synthetic biology. In order to establish a controllable production platform exploiting well-characterized biocomponents, and to modify the wax ester synthesis pathway of A. baylyi ADP1 in terms product quality, a fatty acid reductase complex LuxCDE with an inducible arabinose promoter was employed to replace the natural fatty acyl-CoA reductase acr1 in ADP1. The engineered strain was able to produce wax esters by the introduced synthetic pathway. Moreover, the fatty alkanol chain length profile of wax esters was found to shift toward shorter and more saturated carbon chains, C16:0 accounting for most of the alkanols. The study demonstrates the potentiality of recircuiting a biosynthesis pathway in a natural producer, enabling a regulated production of a customized bioproduct. Furthermore, the LuxCDE complex can be potentially used as a well-characterized biopart in a variety of synthetic biology applications involving the production of long-chain hydrocarbons.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Research area: Design, Development and LCM, Urban circular bioeconomy (UrCirBio), Neste Oil Oyj
Contributors: Santala, S., Efimova, E., Koskinen, P., Karp, M. T., Santala, V.
Number of pages: 7
Pages: 145-151
Publication date: 21 Mar 2014
Peer-reviewed: Yes

Publication information
Journal: ACS Synthetic Biology
Volume: 3
Issue number: 3
ISSN (Print): 2161-5063
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Scopus rating (2014): CiteScore 4.6 SJR 3.809 SNIP 1.134
Original language: English
ASJC Scopus subject areas: Biochemistry, Genetics and Molecular Biology (miscellaneous), Biomedical Engineering, Medicine(all)
Keywords: Acinetobacter baylyi ADP1, fatty-acyl CoA reductase, long chain aldehyde, luxCDE, recircuiting, wax ester
DOIs:

10.1021/sb4000788
URLs:

http://www.scopus.com/inward/record.url?scp=84896925324&partnerID=8YFLogxK (Link to publication in Scopus)

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-02-15
Publisher name: American Chemical Society
Source: researchoutputwizard
Source ID: 1454
Research output: Contribution to journal › Article › Scientific › peer-review

"Rocky Fountains" of Keciören, Turkey

General information
Publication status: Published
MoE publication type: B2 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering
Contributors: Katko, T. S.
Pages: 128-131
Publication date: 2012

Host publication information
Title of host publication: Water Fountains in the Worldscape
Place of publication: Kangasala
Publisher: International Water History Association and KehräMedia
Editors: Ari, J. H., Petri, S. J., Tapio, S. K.
ISBN (Print): 978-951-98151-8-3

Bibliographical note
Contribution: organisation=keb bio,FACT1=1

Source: researchoutputwizard
Source ID: 4443
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific

Rural electrification of remote areas - Case studies of two renewable energy projects in Laos and The Philippines

General information
Publication status: Published
MoE publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Energy and Process Engineering
Contributors: Mustonen, S.
Pages: 8 p
Publication date: 2008

Host publication information
Title of host publication: International Conference on Environment 2008 (ICENV 2008), 15-17 December, 2008, Penang, Malaysia

Bibliographical note
Conference Proceedings CD-Rom / electronic
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 13098
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific

Rural energy survey and scenario analysis of village energy consumption: A case study in Lao People's Democratic Republic

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Mustonen, S. M.
Pages: 1040-1048
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Energy Policy
Volume: 38
Issue number: 2
ISSN (Print): 0301-4215
Ratings:

Scopus rating (2010): SJR 1.478 SNIP 1.844
Original language: English
DOIs:

10.1016/j.enpol.2009.10.056
URLs:

http://www.elsevier.com/locate/enpol

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 8824
Research output: Contribution to journal › Article › Scientific › peer-review

Rural household electricity load profiles with a load simulation tool

General information
Publication status: Published
MoE publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Energy and Process Engineering
Contributors: Poudyal, A., Mustonen, S., Paatero, J.
Pages: 1358-1366
Publication date: 2010

Host publication information
Title of host publication: International Conference on Applied Energy (ICAE 2010), Energy Solutions for a Sustainable World, 21-23 April 2010, Singapore
URLs:
http://www.icae2010.org/

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 9035
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific

Rural Water and Sanitation: Community Managed Project Approach for Sustainability in Ethiopia

Water is a natural need and basic requirement of humankind. Civilization, human settlements, establishments of industry, and locations of agricultural farms have been linked to the presence of water sources. However, the availability of freshwater resources is gradually becoming more challenged by climate change, and service production is being influenced by several factors, including population growth and service breakdowns. A potable water supply for all is unquestionable for enhancing development, education, economies, and social performance. Moreover, sanitation is mandatory for maintaining clean and potable water supply sources. Striving to improve water and sanitation services and focusing on service delivery are fundamental to societies' overall wellbeing.

The concept of service delivery extends beyond investment in the initial implementations of systems. Instead, it includes sound operation and maintenance of facilities and ensures availability of services throughout the lives of the built systems. Service delivery endeavours are overwhelmed by the implementations of new systems because most of the actors in the sector are actively building new schemes instead of rehabilitating existing ones. Therefore, the tendency in service coverage often means moving two steps forward and one step back because of service failures. To overcome this challenge, the future paradigm should be to intensify the service delivery and make it as important as the implementation of new systems. Stakeholders, particularly user communities, should be involved in every step of the process of implementing the systems that serve them to establish feelings of ownership and to give them active roles during post-construction.

The objective of this study is to obtain insight into service delivery in which the user community is at the centre of service production. It assesses the effects and effectiveness of the Community Managed Project Approach (CMP) in Ethiopia. The study was conducted in the Amhara and Benishangul-Gumuz regions in northwest Ethiopia. These regions were selected because of the presence of CMP and the availability of other implementation approaches for comparison. Data were collected using numerous methods, such as household surveys (n = 1806), focus groups (n = 49), field observations (n = 49), and personal interviews with governmental officials at the district, regional, and federal levels (n = 7). Based on these data, four peer-reviewed journal articles and one international peer-reviewed conference paper were published.

The results of this study indicate that community management is a preferable way to extend water supply and sanitation services in rural areas. The participation of user communities should be managed so that genuine participation leads to feelings of ownership. However, all types of participation (labour, financial, and material contributions) are not always possible to achieve ownership. In some circumstances, the concept of participation might be abused, which might lead to forced involvement. In that case, the dream of community participation might not be realized. Regarding this, CMP has remarkably performed for reaching and involving user communities. To create strong, cohesive, and collective actions, exploring local experiences is crucial. For example, the traditional water management of the Borana and Konso communities in southern Ethiopia are significantly more sustainable than the modern systems built in these areas because of the philosophical differences in management between the community schemes and the introduced schemes.

This study suggests that a wide variety of perspectives on service provision and production should be considered. Community participation should be clearly defined and sensibly implemented. Failure of community participation in the process of building community management might be due to technical experts' lack of understanding of the reasons that a community should be involved and to citizens' resistance. Several factors are identified as reasons for frequent service failures in rural water supply, including institutional and social aspects. Therefore, understanding the factors behind the problems, incorporating social capital, and engaging traditional knowledge could improve efforts to sustain service delivery.

General information
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MoE publication type: G5 Doctoral dissertation (article)
Organisations: Department of Civil Engineering
Contributors: Behailu, B. M.
Number of pages: 77
Publication date: 30 Nov 2016

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Original language: English

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Volume: 1435
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Electronic versions:
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URLs:
http://urn.fi/URN:ISBN:978-952-15-3867-4
Research output: Book/Report › Doctoral thesis › Collection of Articles

Saasta: Jätevesien puhdistus ja viemäröinti

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, University of Tampere
Contributors: Juuti, P., Rajala, R., Katko, T. S.
Pages: 137-174
Publication date: 2009

Host publication information
Title of host publication: Elämän virta : Kajaanin veden historia
Publisher: TamPub
Editors: Juuti, P., Rajala, R., Katko, T.
ISBN (Print): 978-951-800-320-8
ISBN (Electronic): 978-951-44-7657-0
URLs:
http://urn.fi/urn:isbn:978-951-44-7657-0
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Safety of lead water pipes: history and present

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, Former organisation of the author
Contributors: Vuorinen, H. S., Juuti, P. S., Katko, T. S.
Number of pages: 7
Pages: 89-96
Publication date: 2013

Host publication information
Title of host publication: Water Services Management and Governance : Lessons for a Sustainable Future
Publisher: IWA Publishing
Editors: Katko, T. S., Juuti, P. S., Schwartz, K., Rajala, R. P.
ISBN (Print): 978-1-78040-022-8
ISBN (Electronic): 978-1-78040-073-0

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-09-29
Source: researchoutputwizard
Source ID: 3724
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Sähköautoilla suuri vähennys päästöihin - pian myös kilpailukykyiseen hintaan

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study

Organisations: Civil Engineering, Research group: Transport Research Centre Verne, Suomen ympäristökeskus SYKE - Finnish Environment Institute, Helsingin yliopisto, University of Helsinki
Contributors: Seppälä, J., Munther, J., Viri, R., Liimatainen, H., Weaver, S., Ollikainen, M.
Publication date: 13 Dec 2019

Publication information
Publisher: Suomen ilmastopaneeli
Original language: Finnish
URLs:
https://www.ilmastopaneeli.fi/wp-content/uploads/2019/12/Ilmastopaneeli_raportti_sahkoautoA4_v03.pdf
Research output: Book/Report › Commissioned report › Professional

Sähköautoilun edistäminen vaatii latausmahdollisuuksien kehittämistä

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Civil Engineering, Research group: Transport Research Centre Verne
Contributors: Liimatainen, H., Utriainen, R., Viri, R.
Number of pages: 7
Publication date: 29 Aug 2018

Publication information
Publisher: Suomen ilmastopaneeli
Original language: Finnish
Electronic versions:
Julkaisu
URLs:
http://urn.fi/URN:NBN:fi:tty-201812172861
https://www.ilmastopaneeli.fi/tiedotteet/kunnilla-ja-taloyhtioilla-on-merkittava-rooli-sahkoautoilun-edistamisessa-nyt-taloyhtion-paatos-voi-estaa-latauspisteen-rakentamisen/
Research output: Book/Report › Commissioned report › Professional

Sähkö- ja elektroniikkateollisuuden ympäristökysymykset

General information
Publication status: Published
MoE publication type: D5 Text book, professional manual or guide or a dictionary
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L., Alanko, T.
Number of pages: 120
Publication date: 2011

Publication information
Publisher: Tampereen teknillinen yliopisto
ISBN (Print): 978-952-15-2645-9
Original language: Finnish

Publication series
Name: Tampereen teknillinen yliopisto, Energia- ja prosessitekniikan laitos, Opintomoniste
Publisher: Tampereen teknillinen yliopisto
Volume: 1
ISSN (Print): 1799-9138

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 6416
Research output: Book/Report › Book › Professional

Sanitation, water and health

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Rautanen, S., Luonsi, A., Nygård, H., Vuorinen, H., Rajala, R.
Pages: 173-194
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Environment and History
Volume: 16
Issue number: 2
ISSN (Print): 0967-3407
Ratings:

Scopus rating (2010): SJR 0.195 SNIP 0.93
Original language: English
DOIs:

10.3197/096734010X12699419057250

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 9094
Research output: Contribution to journal › Article › Scientific › peer-review

Sata vuotta Suomen suurimmasta lavantautiepidemiasta

General information
Publication status: Published
MoE publication type: A2 Review article in a scientific journal
Organisations: Civil Engineering
Contributors: Juuti, P., Rajala, R.
Number of pages: 3
Pages: 12-14
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: Vesitalous
Volume: 2017
Issue number: 1
ISSN (Print): 0505-3838
Original language: Finnish
URLs:

http://www.vesitalous.fi/vesitalous-lehdet/vesien-historia/
Research output: Contribution to journal › Review Article › Scientific › peer-review

Sata vuotta vesihuoltoa Suomessa

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Civil Engineering
Contributors: Juuti, P., Katko, T. S., Rajala, R.
Number of pages: 3
Pages: 13-15
Publication date: Dec 2017
Peer-reviewed: Yes

Publication information
Journal: Vesitalous
Volume: 58
Issue number: 6
ISSN (Print): 0505-3838

Original language: Finnish
Research output: Contribution to journal › Article › Scientific › peer-review

Scaling up the treatment of the fine fraction from landfill mining: Mass balance and cost structure

The treatment of the fine fraction (FF) obtained from landfill mining is necessary in order to reduce the amount of organic matter and biological activity in FF, thus increasing its potential to be utilized after landfill mining. This paper suggests the scaled up anaerobic and aerobic treatment of FF, with or without continuous irrigation, and presents the mass balance and cost structure of such treatment based on two hypothetical landfills. The physical treatment structure for the treatment of FF should prevent emissions, and in this paper, it includes suitable bottom and top liners as well as the collection and treatment of the gaseous and leachate emissions formed during the treatment. Methane produced in anaerobic treatments could either be utilized for energy recovery or be flared. The cost of the anaerobic and aerobic treatment of FF, including investments and operation costs, are 20–65 €/t FF, depending on size of the landfill. The costs of anaerobic treatment and passive aeration are similar, and active aeration is slightly more expensive, but the cost of the continuous irrigation is the most significant, as it multiplies the leachate treatment costs. The overall cost of treatment could be lowered by reducing the treatment time and utilizing existing landfill structures. The results of this paper can be used in planning and estimating the cost of the biological treatment of FF when evaluating landfill mining projects, as the fate of FF may have a major impact on the economics of landfill mining projects.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Research group: Bio- and Circular Economy, Materials Science and Environmental Engineering, Mustankorkea Ltd. Waste Management Company
Contributors: Mönkäre, T., Palmroth, M. R., Sormunen, K., Rintala, J.
Number of pages: 8
Pages: 464-471
Publication date: 15 Mar 2019
Peer-reviewed: Yes

Publication information

Journal: Waste Management
Volume: 87
ISSN (Print): 0956-053X
Ratings:

Scopus rating (2019): CiteScore 9.6 SJR 1.634 SNIP 2.106
Original language: English
ASJC Scopus subject areas: Waste Management and Disposal
Keywords: Biological treatment, Cost structure, Fine fraction, Landfill mining, Mass balance
DOIs:

10.1016/j.wasman.2019.02.032
URLs:

http://www.scopus.com/inward/record.url?scp=85061658603&partnerID=8YFLogxK (Link to publication in Scopus)
Source: Scopus
Source ID: 85061658603
Research output: Contribution to journal › Article › Scientific › peer-review

Screening biological methods for laboratory scale stabilization of fine fraction from landfill mining

Abstract Increasing interest for the landfill mining and the amount of fine fraction (FF) in landfills (40–70% (w/w) of landfill content) mean that sustainable treatment and utilization methods for FF are needed. For this study FF (<20 mm) was mined from a municipal solid waste (MSW) landfill operated from 1967 to 1989. FF, which resembles soil, was stabilized in laboratory scale reactors in two phases: first, anaerobically for 101 days and second, for 72 days using four different methods: anaerobic with the addition of moisture (water) or inoculum (sewage sludge) and aerobic with continuous water washing, with, or without, bulking material. The aim was to evaluate the effect on the stability of mined FF, which has been rarely reported, and to study the quality and quantity of gas and leachate produced during the stabilization experiment. The study showed that aerobic treatment reduced respiration activity (final values 0.9–1.1 mg O2/g TS) and residual methane potential (1.1 L CH4/kg TS) better than anaerobic methods (1.8–2.3 mg O2/g TS and 1.3–2.4 L CH4/kg TS, respectively). Bulking material mixed in FF in one aerobic reactor had no effect on the stability of FF. The benefit of anaerobic treatment was the production of methane, which could be utilized as energy. Even though the inoculum addition increased methane production from FF about 30%, but the methane production was still relatively low (in total 1.5–1.7 L CH4/kg TS). Continuous water washing was essential to remove leachable organic matter and soluble nutrients from FF, while increasing the volume of leachate collected. In the aerobic treatment, nitrogen was oxidized into nitrite and nitrate and then washed out in the leachate. Both anaerobic and aerobic methods could be used for FF stabilization. The use of FF, in landscaping for example, is possible because its nutrient content (4 g N/kg TS and 1 g P/kg TS) can increase the nutrient content of soil, but this may have limitations due to the possible presence of heavy metal and other contaminants.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Contributors: Mönkäre, T. J., Palmroth, M. R. T., Rintala, J. A.
Number of pages: 9
Pages: 739-747
Publication date: 2017
Peer-reviewed: Yes
Early online date: 16 Nov 2016

Publication information
Journal: Waste Management
Volume: 60
ISSN (Print): 0956-053X
Ratings:

Scopus rating (2017): CiteScore 7 SJR 1.456 SNIP 2.14
Original language: English
Keywords: Aerobic stabilization, Anaerobic stabilization, Fine fraction, Landfill mining, Leachate
Electronic versions:

Mönkäre et al 2017. Embargo ended: 28/02/19
DOIs:

10.1016/j.wasman.2016.11.015
URLs:

http://urn.fi/URN:NBN:fi:tty-201903261333. Embargo ended: 28/02/19
Source: RIS
Source ID: urn:592197DDB3F400BDF07AF04E54A2897D
Research output: Contribution to journal › Article › Scientific › peer-review

Selecting an indigenous microalgal strain for lipid production in anaerobically treated piggery wastewater
The aim of this study was to select a potential microalgal strain for lipid production and to examine the suitability of anaerobically treated piggery wastewater as a nutrient source for production of lipid-rich biomass with the selected microalga. Biomass and lipid productivity of three microalgal strains (Chlorella sorokiniana CY1, Chlorella vulgaris CY5 and Chlamydomonas sp. JSC-04) were compared by using different media, nitrogen sources, and nitrogen concentrations. The highest lipid content and productivity (62.5 wt%, 162 mg/L/d) were obtained with C. vulgaris with BG-11 with 62 mg N/L. Secondly, C. vulgaris was cultivated in sterilized, diluted (1–20×), anaerobically treated piggery wastewater. Biomass production decreased and lipid content increased, when wastewater was more diluted. The highest lipid content of 54.7 wt% was obtained with 20× dilution, while the highest lipid productivity of 100.7 mg/L/d with 5× dilution. Piggery wastewater is a promising resource for mass production of oleaginous microalgal biomass.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Urban circular bioeconomy (UrCirBio)
Contributors: Marjakangas, J. M., Chen, C., Lakaniemi, A., Puhakka, J. A., Whang, L., Chang, J.
Number of pages: 8
Pages: 369-376
Publication date: Sep 2015
Peer-reviewed: Yes

Publication information
Journal: Bioresource Technology
Volume: 191
ISSN (Print): 0960-8524
Ratings:

Scopus rating (2015): CiteScore 9.2 SJR 2.243 SNIP 1.899
Original language: English
Keywords: Lipid production, Chlorella vulgaris, Piggery wastewater
DOIs:

10.1016/j.biortech.2015.02.075
URLs:

http://www.sciencedirect.com/science/article/pii/S0960852415002540

Source: RIS
Source ID: urn:99005CD93E391712ED9AA9AF768F175C
Research output: Contribution to journal › Article › Scientific › peer-review

Self-reported use of ICT (Information and communication technology) uptake in 2002 and discomfort amongst Finns aged 45-66

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L., Pääkkönen, R.
Pages: 85-90
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Applied Ergonomics
Issue number: 42
ISSN (Print): 0003-6870
Ratings:

Scopus rating (2010): SJR 0.885 SNIP 1.743
Original language: English
DOIs:

10.1016/j.apergo.2010.05.005
URLs:

http://www.elsevier.com/locate/apergo

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 8438
Research output: Contribution to journal › Article › Scientific › peer-review

Service Failures of Rural Water Supply Systems in Ethiopia and Their Policy Implications
As the world is striving to improve water supply coverage, a significant number of rural communities are forced to turn back to unprotected sources due to service breakdowns of their water supply systems. Yet, these communities do not seem to receive the same attention as those building new systems. The purpose of this article is to reveal and diagnose the determinant factors of service failures and to propose mitigation measures to the rural water supply in Ethiopia. The study is conducted through a literature review and field discussions with experts (n = 48) and artisans (n = 35), who have been involved in the implementation, operation, and maintenance of the systems. Moreover, failed schemes (n = 20) were visited, and discussions were held with village elders of each water point. The findings indicate that lack of uniformity of implementation approaches, and institutional and organizational incapability of the local government aggravate the service failures. The further capacity building, institutionalization, and improving remuneration of employees are likely to reduce the problems substantially.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering
Contributors: Behailu, B. M., Hukka, J. J., Katko, T. S.
Pages: 179-196
Publication date: 2017
Peer-reviewed: Yes
Early online date: 1 Jul 2016

Publication information
Journal: Public Works Management & Policy
Volume: 22
Issue number: 2
ISSN (Print): 1087-724X
Ratings:

Scopus rating (2017): CiteScore 1 SJR 0.307 SNIP 0.724
Original language: English

DOIs:
10.1177/1087724X16656190
Research output: Contribution to journal › Article › Scientific › peer-review

Short Global History of Fountains

Water fountains are part of every human settlement, and historical and mythological stories. They are the source from which life-sustaining water was distributed to people until piped systems started providing fresh tap water inside buildings. In many places, people visit fountains to experience the freshness of running water, to prepare for prayers, or to make a wish. Fountains have also provided water for the people of cities under siege, and purified believers as part of holy rites. The Castalia shrine in Delphi, Greece, for its part, is a spot where various groups of people come to socialize, which greatly improves the quality of their lives. This paper is a look back through the history of fountains in various parts of the world. Experts from various areas have identified the historic, cultural, and ritualistic aspects of fountains and their findings are summarized. The paper concludes by providing a glimpse into the role of fountains in modern society and their continued influence in our lives today.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Life Cycle Effectiveness of the Built Environment (LCE@BE) , NTUA, Dept Architecture Engn, PhDc, Univ Perugia, Dept Phys & Geol, Natl Res Ctr, Water Pollut Res Dept, Univ Salerno, Dept Ind Engn, Yunnan Acad Social Sci, Federutility, Natl Fdn Agr Res NAGREF, Inst Irakl, University of Tampere, Former organisation of the author
Contributors: Juuti, P. S., Antoniou, G. P., Dragoni, W., El-Gohary, F., De Feo, G., Katko, T. S., Rajala, R. P., Zheng, X. Y. , Drusiani, R., Angelakis, A. N.
Number of pages: 35
Pages: 2314-2348
Publication date: May 2015
Peer-reviewed: Yes

Publication information

Journal: Water
Volume: 7
Issue number: 5
ISSN (Print): 2073-4441
Ratings:
Scopus rating (2015): CiteScore 1.9 SJR 0.53 SNIP 1.057
Original language: English
Keywords: Chinese civilizations, Egyptians, Etruscans, Minoans, Hellenes, Medieval times, Ottomans, Romans, water distribution, water supply systems, URBAN WATER, SYSTEMS
DOIs:
10.3390/w7052314

Bibliographical note

EXT="Juuti, Petri S."
EXT="Rajala, Riikka P."
Source: WOS
Source ID: 000356935900013
Research output: Contribution to journal › Article › Scientific › peer-review

Sidosryhmien näkemykset jätehuollon markkinoistumisesta

General information

Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering
Contributors: Kallio, O., Heino, O., Valkama, P., Autero, A.
Number of pages: 15
Pages: 144-158
Publication date: 2013

Host publication information

Title of host publication: Markkinainnovaatiot yhdyskuntajätehuollossa : tutkimus jätehuoltopalvelujen markkinoiden evoluutiosta, sovelluksista ja jännitteistä kunnallisen ja yksityisen sektorin rajapinnassa
Place of publication: Tampere

Publisher: Tampereen yliopisto, Johtamiskorkeakoulu
Editor: Valkama, P.
ISBN (Print): 978-951-44-9163-4
ISBN (Electronic): 978-951-44-9164-1
URLs:
http://www.uta.fi/jkk/yhteystiedot/hallintotiede/valkama/projects/subprojects/VALKAMA3kirjapainojune2013.pdf

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-07-29
Source: researchoutputwizard
Source ID: 2473
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Significance of Wild Cards and Weak Signals for Sustainability : Case of Water Services

General information
Publication status: Published
MoE publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Chemistry and Bioengineering
Contributors: Heino, O. A., Takala, A. J.
Pages: 410-422
Publication date: 2011

Host publication information
Title of host publication: Trends and Future of Sustainable Development, Proceedings of the Conference "Trends and Future of Sustainable Development", 9 - 10 June 2011, Tampere, Finland
Publisher: Finland Futures Research Centre, University of Turku
Editors: Lakkala, H., Vehmas, J.
Article number: 15
ISBN (Print): 978-952-249-131-2
ISBN (Electronic): 978-952-249-131-2

Publication series
Name: FFRC eBOOK
ISSN (Print): 1797-1322
URLs:
http://ffrc.utu.fi/julkaisut/e-julkaisuja/eBook_2011-15.pdf

Bibliographical note
ei ut-numeroa 8.3.2014
Contribution: organisation=keb bio,FACT1=1
Publisher name: Finland Futures Research Centre, University of Turku
Source: researchoutputwizard
Source ID: 6061
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific

Simulointi nopeuttaa käyttöiän määritystä

General information
Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Department of Materials Science, Research group: Tribology and Machine Elements, Department of Mechanical Engineering and Industrial Systems, Research group: Kokeellinen virtaustekniikka, Research area: Applied Mechanics, Department of Intelligent Hydraulics and Automation, Research group: Fluid power automation in mobile machines, Department of Electrical Engineering, Research area: Reliability
Contributors: Ojala, P., Saarenrinne, P., Miettinen, J., Multanen, P., Kiilunen, J., Hietala, J., Kolu, A., Pippola, J., Mostofizadeh, M., Ylönen, M.
Number of pages: 4
Pages: 24-27
Publication date: 2015
Peer-reviewed: Unknown

Publication information
Journal: Promaint
Volume: 2
ISSN (Print): 1797-2000

Original language: Finnish

Bibliographical note
ORG=mol,0.25
ORG=mei,0.25
ORG=iha,0.25
ORG=dee,0.25
Research output: Contribution to journal › Article › Professional

Simultaneous detection of three antiviral and four antibiotic compounds in source-separated urine with liquid chromatography

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Pynnönen, S., Tuhkanen, T. A.
Number of pages: 9
Pages: 219-227
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Journal of Separation Science
Volume: 37
Issue number: 3
ISSN (Print): 1615-9306
Ratings:

Scopus rating (2014): CiteScore 4.4 SJR 1.124 SNIP 1.005
Original language: English
DOIs:

10.1002/jssc.201300492

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-02-15
Publisher name: Wiley - V C H Verlag GmbH & Co. KGaA
Source: researchoutputwizard
Source ID: 1319
Research output: Contribution to journal › Article › Scientific › peer-review

Simultaneous nutrient removal and lipid production with Chlorella vulgaris on sterilized and non-sterilized anaerobically pretreated piggery wastewater
Piggery wastewater is a potent nutrient source for microalgal lipid production. Wastewater has been usually sterilized when used for microalgal cultivation. This is uneconomical in large-scale applications. Therefore, lipid productivity of Chlorella vulgaris CY5 using sterilized and non-sterilized diluted anaerobically pretreated piggery wastewater was studied in batch reactors. The maximum average lipid productivity was obtained after 12 days of incubation and it was higher with the sterilized wastewater than with the non-sterilized one (117g/L/d vs. 91.3g/L/d), due to the higher biomass concentration. Because of the unexpected increase of dissolved organic carbon (DOC) in the cultures, second experiment was conducted to characterize the composition of produced DOC in non-sterilized wastewater. Carbohydrate content increased in the liquid phase but decreased in the biomass after nitrogen had been exhausted. After 12 days of incubation, soluble chemical oxygen demand (COD<inf>s</inf>) was 414±56mg/L, biomass production was 2.8±0.15g/L, and lipid content was 30.3±1.2wt%. Average lipid productivity from day zero to day 12 was 70.5±1.1g/L/d. C. vulgaris removed nutrients from the non-sterilized wastewater and produced oleaginous biomass, although the lipid productivity was higher with sterilized wastewater.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Urban circular bioeconomy (UrCirBio), Center of Bioscience and Biotechnology, Research Center for Energy Technology and Strategy, National Cheng Kung University, Department of Environmental Engineering, Department of Chemical Engineering
Contributors: Marjakangas, J. M., Chen, C. Y., Lakaniemi, A. M., Puhakka, J. A., Whang, L. M., Chang, J. S.
Number of pages: 8
Pages: 177-184

Publication date: 5 Nov 2015
Peer-reviewed: Yes
Early online date: 23 Jul 2015

Publication information
Journal: Biochemical Engineering Journal
Volume: 103
ISSN (Print): 1369-703X
Ratings:

Scopus rating (2015): CiteScore 4.6 SJR 0.952 SNIP 1.075
Original language: English
ASJC Scopus subject areas: Biotechnology, Bioengineering, Biomedical Engineering, Environmental Engineering
Keywords: Aerobic process, Lipid production, Microalgae, Piggery wastewater, Sterilization, Wastewater treatment
DOIs:

10.1016/j.bej.2015.07.011
URLs:

http://www.scopus.com/inward/record.url?scp=84939202209&partnerID=8YFLogxK (Link to publication in Scopus)
Source: Scopus
Source ID: 84939202209
Research output: Contribution to journal › Article › Scientific › peer-review

Sisäympäristön laadun ja terveellisyyden arviointi energiaparannuskohteissa

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Research group: Concrete and Bridge Structures, Research area: Structural Engineering, Department of Civil Engineering, Research group: Building Physics, Natl Inst Hlth & Welf, Finland National Institute for Health & Welfare, Dept Environm Hlth
Contributors: Mari, T., Leivo, V., Pekkonen, M., Aaltonen, A., Kiviste, M., Haverinen-Shaughnessy, U.
Number of pages: 6
Pages: 13-18
Publication date: 16 Mar 2016

Host publication information
Title of host publication: Sisäilmastoseminaari 2016, Sisäilmayhdistys raportti 34
Publisher: SIY SISÄILMATIETO OY
ISBN (Print): 978-952-5236-44-6
URLs:

http://sisailmayhdistys.omaverkkokauppa.fi/epages/sisailmayhdistys.sf/fi_FI/?ObjectPath=/Shops/2015081803/Products/SE16
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Sleepers

General information
Publication status: Published
Organisations: Civil Engineering, Research group: Track Structures
Contributors: Luomala, H.
Publication date: 24 Nov 2016

Publication information
Media of output: Presentation at Nordisk Banteknisk Ingenjörsutbildning (NBIU), Espoo
Year: 2016
Original language: English
Research output: Other contribution › Scientific

Social Norms in Water Services: Exploring the Fair Price of Water
The aim of this article is to analyse price fairness in water services. Although a considerable amount of literature has been published on water pricing, these studies have mainly approached the question from instrumental and rational perspectives. Little attention has been paid to the human side of water pricing. Therefore, the general objective of this research is to shed light on these softer factors, filling the gap in knowledge of the emotional connections with water services. In this research, we explored people’s ideas and views about water pricing by conducting 74 interviews in 11 municipalities in Finland. The results suggest that people are not just rational consumers of a good but also have

emotional ties to water utilities and municipal decision-making. The general attitude towards a water utility is confident and sympathetic if its operations and municipal decision-making processes are considered as fair, and vice versa. This is a topical issue as many water utilities are facing pressures to increase water prices; being fair appeared to be crucial way to gain appreciation and support through difficult times. Because fairness seems to be an emergent property of social experiences, special attention should be paid to the “soft side” of water services.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Heino, O., Takala, A.
Number of pages: 15
Pages: 844-858
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Water Alternatives
Volume: 8
Issue number: 1
ISSN (Print): 1965-0175
Ratings:

Scopus rating (2015): CiteScore 4.5 SJR 0.899 SNIP 1.402
Original language: English
Keywords: Water services, Water pricing, Price fairness, Social Norms, Finland
URLs:

http://www.water-alternatives.org/index.php/alldoc/articles/vol8/v8issue1/268-a8-1-12/file
Research output: Contribution to journal › Article › Scientific › peer-review

Sorption of zinc onto elemental selenium nanoparticles immobilized in Phanerochaete chrysosporium pellets
The use of a novel hybrid biosorbent, elemental selenium nanoparticles (nSe^0) immobilized in pellets of Phanerochaete chrysosporium, to remove Zn from aqueous solutions was investigated. Fungal pellets containing nSe^0 (nSe^0-pellets) showed to be better biosorbents as they removed more Zn (88.1 ± 5.3 %) compared to Se-free fungal pellets (56.2 ± 2.8 %) at pH 4.5 and an initial Zn concentration of 10 mg L^{-1}. The enhanced sorption capacity of nSe^0-pellets was attributed to a higher concentration of sorption sites resulting in a more negative surface charge density, as determined by analysis of the potentiometric titration data. Fourier transform infrared spectroscopy (FT-IR) analysis of fungal pellets prior to and after being loaded with Zn showed the functional groups, including hydroxyl and carboxyl groups, involved in the sorption process. The experimental data indicated that the sorption rate of the nSe^0-pellets fitted well to the pseudo-second order kinetic model (R^2 = 0.99), and the sorption isotherm was best represented by the Sips model (Langmuir-Freundlich) with heterogeneous factor n = 1 (R^2 = 0.99), which is equivalent to the Langmuir model. Operational advantages of fungal pelleted reactors and the Zn removal efficiencies achieved by nSe^0-pellets under mild acidic conditions make nSe^0-pellet based bioreactors an efficient biosorption process.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Hydraulic and Environmental Engineering (IHE) Inst. for Water Education, Environmental Engineering and Water Technology Department, Université Paris-Est
Contributors: Espinosa-Ortiz, E. J., Shakya, M., Jain, R., Rene, E. R., van Hullebusch, E. D., Lens, P. N. L.
Number of pages: 12
Pages: 21619–21630
Publication date: 2016
Peer-reviewed: Yes

Publication information
Journal: Environmental Science and Pollution Research
Volume: 23
Issue number: 21
ISSN (Print): 0944-1344
Ratings:

Scopus rating (2016): CiteScore 4 SJR 0.891 SNIP 1.127
Original language: English
ASJC Scopus subject areas: Environmental Chemistry, Medicine(all), Pollution, Health, Toxicology and Mutagenesis
Keywords: Fungal pellets, Hybrid biosorbent, Phanerochaete chrysosporium, Selenium nanoparticles, Zinc biosorption

DOIs:
10.1007/s11356-016-7333-6
Source: Scopus
Source ID: 84982179903
Research output: Contribution to journal › Article › Scientific › peer-review

Spatial variations in bacterial and archaeal abundance and community composition in boreal forest pine mycorrhizospheres

Mycorrhizal fungi have a strong impact on soil biota. In this study, bacterial and archaeal populations in different parts of Suillus bovinus - Pinus sylvestris mycorrhizospheres in boreal forest were quantified and identified by DNA analysis. The numbers of bacterial and archaeal 16S rRNA gene copies were highest in uncolonized humus and lowest in fruiting bodies. The numbers of bacterial 16S rRNA gene copies varied from 1.3×10^{7} to 3.1×10^{9} copies g^{-1} fw and archaeal copies from 4.1×10^{7} to 9.6×10^{8} copies g^{-1} fw. The relatively high number of archaeal 16S rRNA gene copies was likely due to the cold and highly organic habitat. The presence of hyphae appeared to further promote archaeal numbers and the archaea:bacteria ratio was over one in samples containing only fungal material. Most detected archaea belonged to terrestrial Thaumarchaeota. Proteobacteria, Actinobacteria and Acidobacteria were predictably the dominating bacterial taxa in the samples with clear trend of Betaproteobacteria preferring the pine root habitats.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Materials Science and Environmental Engineering, Research group: Bio- and Circular Economy, University of Helsinki
Contributors: Rinta-Kanto, J. M., Timonen, S.
Number of pages: 7
Publication date: 2020
Peer-reviewed: Yes

Publication information
Journal: EUROPEAN JOURNAL OF SOIL BIOLOGY
Volume: 97
Article number: 103168
ISSN (Print): 1164-5563
Original language: English
ASJC Scopus subject areas: Microbiology, Soil Science, Insect Science
Keywords: Archaea, Bacteria, Ectomycorrhiza, Microbial community, Mycorrhizosphere, Sporocarp
DOIs:
10.1016/j.ejsobi.2020.103168
Source: Scopus
Source ID: 85079366441
Research output: Contribution to journal › Article › Scientific › peer-review

Stabilization of fine fraction from landfill mining in anaerobic and aerobic laboratory leach bed reactors

Fine fraction (FF, <20mm) from mined landfill was stabilized in four laboratory-scale leach bed reactors (LBR) over 180days. The aim was to study feasibility of biotechnological methods to treat FF and if further stabilization of FF is possible. Four different stabilization methods were compared and their effects upon quality of FF were evaluated. Also during the stabilization experiment, leachate quality as well as gas composition and quantity were analyzed. The methods studied included three anaerobic LBRs (one without water addition, one with water addition, and one with leachate recirculation) and one aerobic LBR (with water addition). During the experiment, the most methane was produced in anaerobic LBR without water addition (18.0LCH<inf>4</inf>/kgVS), while water addition and leachate recirculation depressed methane production slightly, to 16.1 and 16.4LCH<inf>4</inf>/kgVS, respectively. Organic matter was also removed via the leachate and was measured as chemical oxygen demand (COD). Calculated removal of organic matter in gas and leachate was highest in LBR with water addition (59gCOD/kgVS), compared with LBR without water addition or with leachate recirculation (51gCOD/kgVS). Concentrations of COD, ammonium nitrogen and anions in leachate decreased during the experiment, indicating washout mechanism caused by water additions. Aeration increased sulfate and nitrate concentrations in leachate due to oxidized sulfide and ammonium. Molecular weight distributions of leachates showed that all the size categories decreased, especially low molecular weight compounds, which were reduced the most. Aerobic stabilization resulted in the lowest final VS/TS (13.1%), lowest respiration activity (0.9-1.2mgO<inf>2</inf>/gTS), and lowest methane production after treatment (0.0-0.8LCH<inf>4</inf>/kgVS), with 29% of VS being removed from FF. Anaerobic stabilization methods also reduced organic matter by 9-20% compared with the initial amount. Stabilization reduced the quantity of soluble nitrogen in FF and did not alter concentration of soluble and insoluble phosphorus, and insoluble nitrogen. All four stabilization methods decreased organic matter and thus are possible stabilization methods for FF, but aerobic treatment was the most efficient in this study.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry, Urban circular bioeconomy (UrCirBio)
Contributors: Mönkäre, T. J., Palmroth, M. R. T., Rintala, J. A.
Number of pages: 8
Pages: 468-475
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Waste Management
Volume: 45
ISSN (Print): 0956-053X
Ratings:

Scopus rating (2015): CiteScore 6.3 SJR 1.732 SNIP 2.268
Original language: English
ASJC Scopus subject areas: Waste Management and Disposal
Keywords: Aerobic stabilization, Anaerobic stabilization, Fine fraction, Landfill mining, Leach bed reactor
Electronic versions:

Mönkäre et al. 2015. Embargo ended: 23/10/17
DOIs:

10.1016/j.wasman.2015.06.040
URLs:

http://urn.fi/URN:NBN:fi:tty-201903261331. Embargo ended: 23/10/17
Source: Scopus
Source ID: 84945472197
Research output: Contribution to journal › Article › Scientific › peer-review

Stabilization of fine fraction from landfill mining in leach bed reactor

General information
Publication status: Published
MoE publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Chemistry and Bioengineering, Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Contributors: Mönkäre, T., Palmroth, M., Rintala, J.
Number of pages: 11
Pages: 1-11
Publication date: 2014

Host publication information
Title of host publication: Proceedings SUM 2014, Second Symposium on Urban Mining, Bergamo, Italy, 19-21 May, 2014 : Organised by IWWG - International Waste Working Group
Publisher: CISA Publishers
ISBN (Print): 978-88-6265-031-1

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-06-27
Publisher name: CISA Publishers
Source: researchoutputwizard
Source ID: 1097
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific

Struvite precipitation in raw and co-digested swine slurries for nutrients recovery in batch reactors
The release of nitrogen (N) and phosphorus (P) from agro-industrial sources is a major environmental concern. Furthermore, the scarcity of mineable P and the growing demand for food worldwide necessitate that we find an alternative P source. This study applied struvite precipitation for N-P recovery to slurries with high levels of organics and ammonia to achieve environmental protection from excessive nutrients diffusion and to generate a sustainable P source. Batch tests were carried out on raw and co-digested swine slurries to study the feasibility of struvite precipitation and the effect of several parameters, including pH, reaction time, competing ions (Ca²⁺, K⁺), total solids (TS), and alkalinity. The batch assays with raw swine slurries showed high N-P removals (up to 80%), while the anaerobic liquor returned lower recovery efficiency due to the high solids and alkali content. Struvite crystallization was detected at pH values as low as 6, and the characteristics of the recovered struvite matched those of the theoretical. Slight co-precipitation of calcium-phosphates occurred and was dependent on the Ca²⁺/Mg²⁺ ratio

rather than on varying pH values. Struvite precipitation was shown to be feasible in complex matrices as agro-industrial effluents, characterized by high NH<inf>4</inf>⁺, alkalinity, solids and organic content, and interfering ions such as Ca²⁺ and K⁺.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Taddeo, R., Lepistö, R.
Number of pages: 6
Pages: 892-897
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Water Science and Technology
Volume: 71
Issue number: 6
ISSN (Print): 0273-1223
Ratings:

Scopus rating (2015): CiteScore 2.2 SJR 0.464 SNIP 0.596
Original language: English
ASJC Scopus subject areas: Environmental Engineering, Water Science and Technology
Keywords: Eutrophication, Manure treatment, Nutrients removal and recovery, Struvite
DOIs:

10.2166/wst.2015.045
URLs:

http://www.scopus.com/inward/record.url?scp=84929000113&partnerID=8YFLogxK (Link to publication in Scopus)
Source: Scopus
Source ID: 84929000113
Research output: Contribution to journal › Article › Scientific › peer-review

Students' Perceived Priorities on Water as a Human Right, Natural Resource, and Multiple Goods
s often noted, water is one of the most critical natural resources in the world—one we must take care of so that future generations can enjoy safe water. This study specifically explores university-level water and environmental students' views on perceived priorities on water. The recent debate on water policy and its complexity is first reviewed, followed by a study on how students perceived water through six predetermined criteria. Interactive learning events (n = 241) were arranged worldwide in 2011–2015 in seven countries and one region: Finland, Latvia, South Africa, Brazil, Mexico, Sri Lanka, USA, and Southern Africa region. The relative distribution of the criteria totaling 100% were as follows: Basic human right 31%, natural resource 25%, economic good 15%, public and social good both 11%, and cultural good 7%. The views did not substantially differentiate despite the different socio-economic conditions. Yet, basic human right should be interpreted wisely remembering environmental, economic, and other realities. Here, the target group consisted of water and environmental students, and it would be very interesting to conduct a comparative study among students in other fields (sociology, economics, etc.). On the whole, we should further analyze the value of water and its priorities to make it easier to manage water resources in the future.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Civil Engineering, Research group: Capacity Development of Water and Environmental Services CADWES , University of Latvia
Contributors: Rajala, R. P., Katko, T. S., Springe, G.
Publication date: 2019
Peer-reviewed: Yes

Publication information
Journal: Sustainability
Volume: 11
Issue number: 22
Article number: 6354
ISSN (Print): 2071-1050
Ratings:

Scopus rating (2019): CiteScore 3.2 SJR 0.581 SNIP 1.165
Original language: English
DOIs:

10.3390/su11226354
Research output: Contribution to journal › Article › Scientific › peer-review

Study of Aerosols of Black Liquor Combustion

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering, Research group: Power Plant and Combustion Technology
Contributors: Leppänen, A., Välimäki, E., Oksanen, A.
Number of pages: 11
Pages: 1-11
Publication date: 2011

Host publication information
Title of host publication: 11th International Conference on Energy for Clean Environment, 5-8 July 2011, Lisbon Portugal
Place of publication: Lisbon
Publisher: Clean Air conference series

Publication series
Name: International Conference on Energy for Clean Environment
Publisher: Clean Air conference series

Bibliographical note
ei ut-numeroa 5.4.2014
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 6600
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Subpicosecond to Second Time-Scale Charge Carrier Kinetics in Hematite-Titania Nanocomposite Photoanodes
Water splitting with hematite is negatively affected by poor intrinsic charge transport properties. However, they can be modified by forming heterojunctions to improve charge separation. For this purpose, charge dynamics of TiO2:alpha-Fe2O3 nanocomposite photoanodes are studied using transient absorption spectroscopy to monitor the evolution of photogenerated charge carriers as a function of applied bias voltage. The bias affects the charge carrier dynamics, leading to trapped electrons in the submillisecond time scale and an accumulation of holes with a lifetime of 0.4 +/- 0.1 s. By contrast, slower electron trapping and only few long-lived holes are observed in a bare hematite photoanode. The decay of the long-lived holes is 1 order of magnitude faster for the composite photoanodes than previously published for doped hematite, indicative of higher catalytic efficiency. These results illustrate the advantages of using composite materials to overcome poor charge carrier dynamics, leading to a 30-fold enhancement in photocurrent.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Frontier Photonics, Department of Chemistry and Bioengineering, Research group: Supramolecular photochemistry, Tampere University of Technology, ETH Zürich, Laboratory for Multifunctional Materials
Contributors: Ruoko, T. P., Kaunisto, K., Bärtsch, M., Pohjola, J., Hiltunen, A., Niederberger, M., Tkachenko, N. V., Lemmetyinen, H.
Number of pages: 6
Pages: 2859-2864
Publication date: 8 Jul 2015
Peer-reviewed: Yes

Publication information
Journal: Journal of Physical Chemistry Letters
Volume: 6
Issue number: 15
ISSN (Print): 1948-7185
Ratings:

Scopus rating (2015): CiteScore 12.7 SJR 4.143 SNIP 1.719
Original language: English
ASJC Scopus subject areas: Materials Science(all)
Keywords: FILM ELECTRODES, IRON-OXIDE, SEMICONDUCTOR ELECTRODES, WATER OXIDATION, VISIBLE-LIGHT, ALPHA-FE2O3, PHOTOELECTRODES, TIO2, RECOMBINATION, ELECTROLYSIS
Electronic versions:

Subpicosecond_post-print
DOIs:
10.1021/acs.jpclett.5b01128
URLs:
http://urn.fi/URN:NBN:fi:tty-201612024836

Bibliographical note
AUX=mol,"Pohjola, Juuso"
Source: Scopus
Source ID: 84938694613
Research output: Contribution to journal › Article › Scientific › peer-review

Suomen vesihuollon kehitys kansainvälisessä kontekstissa

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Civil Engineering
Contributors: Katko, T. .., Juuti, P.
Number of pages: 20
Pages: 5-24
Publication date: 2018
Peer-reviewed: Yes

Publication information
Journal: Tekniikan Waiheita: Teknik I Tiden
Volume: 36
Issue number: 2
ISSN (Print): 0780-5772
Original language: Finnish
ASJC Scopus subject areas: Environmental Science(all), Engineering(all)
Keywords: water services, strategic development, sustainable development, long-term development, History, Futures
URLs:
https://journal.fi/tekniikanwaiheita/index
Research output: Contribution to journal › Article › Scientific › peer-review

Sustainability competencies of engineers in the field of water supply and sanitation

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Chemistry and Bioengineering
Contributors: Takala, A.
Pages: 180-181
Publication date: 2011

Host publication information
Title of host publication: World Sustainable Building Conference SB11, October 18-21, 2011, Helsinki, Finland
Place of publication: Helsinki
Publisher: RIL - Finnish Association of Civil Engineers
ISBN (Print): 978-951-758-534-7

Publication series
Name: World Sustainable Building Conference SB11
Publisher: RIL - Finnish Association of Civil Engineers
Volume: 2
ISSN (Print): 0356-9403

Bibliographical note
poistettu tupla r=3722.Ei ut-numeroa 17.5.2014
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 7348
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Sustainable nutrients recovery and recycling by optimizing the chemical addition sequence for struvite precipitation from raw swine slurries

Livestock farming contributes heavily to nitrogen (N) and phosphorus (P) flows into the environment, a major cause of eutrophication of coastal and freshwater systems. Furthermore, the growing demand for N-P fertilizers is increasing the emission of anthropogenic reactive N into the atmosphere and the depletion of the current P reserves. Therefore, it is essential to minimize the anthropogenic impact on the environment and recycle the wasted N-P for agricultural reuse. This study focused on enhancing struvite ($MgNH_4PO_4*6H_2O$) precipitation from raw swine slurries in batch and laboratory-scale reactors. Different chemical addition sequences were evaluated, and the best removal efficiency (E%) was obtained when the chemicals were mixed before the precipitation process. Struvite was detected at a pH as low as 6 (E%N-P~50%), and high E%N-P was found at pH 7–9.5 (80–95%). Furthermore, air stripping was used in place of NaOH to adjust pH, returning the same efficiency as if only alkali had been used. XRD and FE-SEM analysis of the precipitate showed that the recovered struvite was of high purity with orthorhombic crystalline structure and only trace amounts of impurities from matrix organics, co-precipitation products (CaO and amorphous calcium-phosphates), and residuals of added chemicals (MgO).

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Department of Materials Science
Contributors: Taddeo, R., Kolppo, K., Lepistö, R.
Number of pages: 7
Pages: 52-58
Publication date: 15 Sep 2016
Peer-reviewed: Yes

Publication information

Journal: Journal of Environmental Management
Volume: 180
ISSN (Print): 0301-4797
Ratings:

Scopus rating (2016): CiteScore 5.9 SJR 1.161 SNIP 1.833
Original language: English
ASJC Scopus subject areas: Environmental Engineering, Waste Management and Disposal, Management, Monitoring, Policy and Law
Keywords: Air stripping, Chemical addition, Crystallization, Manure management, Nutrients recycling, Struvite
DOIs:

10.1016/j.jenvman.2016.05.009
Source: Scopus
Source ID: 84978733912
Research output: Contribution to journal › Article › Scientific › peer-review

Syntymä ja kuolema: Laitoksen perustamiseen johtanut kehitys

General information

Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, University of Tampere
Contributors: Juuti, P., Rajala, R., Katko, T. S.
Pages: 37-46
Publication date: 2009

Host publication information

Title of host publication: Elämän virta : Kajaanin veden historia
Publisher: TamPub
Editors: Juuti, P., Rajala, R., Katko, T.
ISBN (Print): 978-951-800-320-8
ISBN (Electronic): 978-951-44-7657-0
URLs:

http://urn.fi/urn:isbn:978-951-44-7657-0
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Syytä olla ylpeä

General information
Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Department of Chemistry and Bioengineering
Contributors: Hukka, J. J., Katko, T. S., Pietilä, P. P.
Pages: 40-40
Publication date: 2011
Peer-reviewed: Unknown

Publication information
Journal: Kehitys
Issue number: 2
Original language: Finnish

Bibliographical note
Kolumni
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 6115
Research output: Contribution to journal › Article › Professional

Taking Water Services to the Next Level: A Paradigm Shift?

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Heino, O.
Number of pages: 6
Pages: 12-17
Publication date: 2017
Peer-reviewed: Yes
Early online date: 2016

Publication information
Journal: Public Works Management & Policy
Volume: 22
Issue number: 1
ISSN (Print): 1087-724X
Ratings:

Scopus rating (2017): CiteScore 1 SJR 0.307 SNIP 0.724
Original language: English
DOIs:

10.1177/1087724X16668181
Source: Bibtex
Source ID: urn:4eb95b4aa19d4699d23b10a4c3e5cb33
Research output: Contribution to journal › Comment/debate › Scientific › peer-review

Tammikuun tehopiikki – mitä tapahtui 7.1.2016? Miten tehoa hallitaan paremmin jatkossa?

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Department of Civil Engineering, Research group: Real estate development, Department of Automation Science and Engineering, Research area: Measurement Technology and Process Control, Department of Electrical Engineering, Research area: Power engineering, Research group: Capacity Development of Water and Environmental Services CADWES, University of Tampere, Tampere University of Applied Science, VTT
Contributors: Heljo, J., Harsia, P., Holttinen, H., Aalto, P., Björkqvist, T., Järventausta, P., Kaivo-oja, J., Kojo, M., Korpela, T., Rautiainen, A., Repo, S., Ruostetsaari, I., Sorri, J.
Pages: 1-15
Publication date: 2016

Publication information
ISBN (Electronic): 978-952-03-0346-4

Publication series
Name: EL-TRAN analyysi
Volume: 7/2016
URLs:
https://tt.eduuni.fi/sites/EL-TRAN/Julkiset%20tiedostot/Juhani%20Heljo%20et%20al.,%20Tammikuun%20tehopiikki%20-%20mit%C3%A4%20tapahtui%207.1.2016,%20miten%20tehoa%20hallitaan%20paremmin%20jatkossa.pdf
Research output: Working paper › Discussion paper › Professional

Tampereelta valmistuneiden vesihuoltoalan diplomi-insinöörien sijoittuminen ja odotukset yliopisto-opetukselle

General information
Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Department of Chemistry and Bioengineering, Department of Civil Engineering, Tampere University of Technology, University of Tampere
Contributors: Katko, T. S., Lukka, A., Rajala, R.
Number of pages: 3
Pages: 45-47
Publication date: 2015
Peer-reviewed: Unknown

Publication information
Journal: Vesitalous
Issue number: 2
ISSN (Print): 0505-3838
Original language: Finnish

Bibliographical note
ORG=keb,1
ORG=rak,0
AUX=orc,"Lukka, Anna"
Research output: Contribution to journal › Article › Professional

Tausta: Jätevedenpuhdistuksen alku, tehtävän määrittely ja keskeiset käsitteet

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, University of Tampere
Contributors: Juuti, P., Rajala, R.
Pages: 7-18
Publication date: 2008

Host publication information
Title of host publication: Ei jätevedenpuhdistamoa minun takapihalleni : Jätevedenpuhdistuksen päätöksenteko, päätäntäprosessit ja julkinen keskustelu Espoossa historiassa, nyt ja tuelvaisuudessa
Publisher: TamPub
Editors: Juuti, P., Rajala, R.
ISBN (Print): 978-951-857-540-8
ISBN (Electronic): 978-951-44-7511-5
URLs:
http://urn.fi/urn:isbn:978-951-44-7511-5
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Tavoitteena puhdas asuinympäristö

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Civil Engineering, University of Tampere
Contributors: Juuti, P., Rajala, R.
Pages: 114-134
Publication date: 2010

Host publication information
Title of host publication: Metropoli ja meri - 100 vuotta jätevedenpuhdistusta Helsingissä
Publisher: TamPub
Editors: Juuti, P., Rajala, R., Katko, T.
URLs:

http://urn.fi/urn:isbn:978-952-6604-09-1
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Technical suitability of the fine fraction of municipal solid waste incineration bottom ash to the landfill capping liner
To protect the natural aggregates and promote the circular economy the suitable secondary aggregates have been studied intensively in last decades in Finland. One promising secondary aggregate is bottom ash from the municipal solid waste incineration (MSWI) process.
The municipal incinerator bottom ash (MIBA, also called MSWI BA) contains heavy metals and other contaminants limiting its environmental acceptability. The fines contain typically the highest concentrations of contaminants. The portion of inert particles such as rock, glass and mineral waste is higher in coarser fractions.
The aim of the study was to assess the suitability of the fines of MIBA to the mineral liner in landfill capping. Based on the environmental permit, the target permeability value for capping liner is $k \leq 1 \cdot 10\text{-}9$ m/s. The permeability of the fines of MIBA is typically around $1 \cdot 10\text{-}7$ m/s when well compacted. In order to achieve the required permeability, bentonite or other additivies are needed. The grains are porous and the pH is high, typically 10-12, which effect on the amount of bentonite required. In addition, the MIBA contain high concentrations of diluting chlorides, sulfides and calcium, which decrease the swelling properties of the bentonite. The swelling capacity of bentonite decreases when permeating aggressive leakages with high cation concentration. Therefore a special polymer treated bentonite were chosen for the tests. The addition of superabsorbent polymers, which have much higher resistance to aggressive leakages, greatly improve the performance and self-healing capacity of bentonite.
First, laboratory tests were performed to estimate the proper amount and quality of the bentonite needed to achieve the permeability required. Two bentonite types were tested, the common natural bentonite and a special polymer modified bentonite produced by Cetco. The swelling index of both types of bentonite were tested by a eluate of MIBA. Several permeability tests were performed to evaluate the effect of dry density, bentonite quality and dose, and portion of coarser grains (2-5 mm).
After laboratory testing, a test area was constructed on an old waste fill to the Ämmässuo. During the construction, it was noticed that the water content effects significantly on the compaction result. The mineral liner was covered by a 1,5 mm thick LLDPE geomembrane and protective geotextile. The liner structure is covered only by a 0,5 m thick drainage layer from crushed rock. No surface layer were constructed.
After one year, the liner was exposed and studied. The quality of the structures, especially the mineral liner were visually evaluated and gas emissions were measured from the surface. The density of the layer was measured by volymeter and troxler and the water content and permeability were measured in laboratory. Based on the visual inspection the surface of the mineral liner was smooth, and the layer homogenious and hardened

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Civil Engineering, Research group: Earth Constructions
Contributors: Leppänen, M., Sarkkila, J., Hämäläinen, H., Rinkinen, J.
Pages: 168-175
Publication date: 6 Jun 2018

Host publication information
Title of host publication: Proceedings of the 10th International Conference on the Environmental and Technical Implications of Construction with Alternative Materials WASCON 2018 : No Gradle, No Grave - Circular Economy into Practice
Publisher: RIL - Finnish Association of Civil Engineers
Editors: Raasakka, V., Lahtinen, P.
ISBN (Electronic): 978-951-758-631-3
Keywords: municipal solid waste bottom slag, Landfill cover, bentonite, chemical incompability
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Technology development theories and water services evolution

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering
Contributors: Antila, K., Katko, T. S., Mattila, H.
Number of pages: 15
Pages: 13-27

Publication date: 2013

Host publication information
Title of host publication: Water Services Management and Governance : Lessons for a Sustainable Future
Publisher: IWA Publishing
Editors: Katko, T. S., Juuti, P. S., Schwartz, K., Rajala, R. P.
ISBN (Print): 978-1-78040-022-8
ISBN (Electronic): 978-1-78040-073-0

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-09-29
Source: researchoutputwizard
Source ID: 1929
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Tempoilevasta tiede- ja koulutuspolitiikasta kohti laajempaa näkemystä

General information
Publication status: Published
MoE publication type: D2 Article in professional manuals or guides or professional information systems or text book material
Organisations: Civil Engineering
Contributors: Katko, T. S., Hukka, J. J.
Number of pages: 8
Pages: 32-39
Publication date: Oct 2017

Host publication information
Title of host publication: Koulutuksen ja tutkimuksen murros yliopistoissa uuden vuosikymmenen kynnyksellä
Place of publication: Tampere
Publisher: Tampereen dosenttiyhdistys
Editors: Juuti, P., Uusi-Rasi, K.
ISBN (Print): 978-951-97614-2-8
ISBN (Electronic): 978-951-97614-3-5

Publication series
Name: Tampereen dosenttiyhdistyksen julkaisuja
URLs:
http://urn.fi/URN:ISBN:978-951-97614-3-5
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Professional

Teräsrumpujen uudet korjausmenetelmät: Halkaistu sisäputki, puolipohjaus ja pohjan betonointi

Tässä tutkimuksessa arvioitiin uudentyyppisten korjausmenetelmien soveltuvuutta teräksestä valmistettujen tierumpujen käyttöiän pidentämiseksi. Tutkimuksessa rajauduttiin tarkastelemaan sellaisia korjausmenetelmiä, joita käyttämällä rumpuputken aukon koko pienenee mahdollisimman vähän. Rumpujen korjaaminen on kannattavinta kohteissa, joissa rummun asennussyvyys on suuri tai tien aukikaivaminen aiheuttaa suuret liikenteenjärjestelykustannukset.

Tutkimuksessa on tarkasteltu kolmea uutta menetelmää: halkaistu sisäputki, puolipohjaus ja pohjan betonointi. Näistä kahta ensinnä mainittua kokeiltiin verraten matalalla peitesyvyydellä olevissa rummuissa, mistä johtuen niistä oli mielekästä mitata myös rumpurakenteen mekaanista toimintaa raskaan ajoneuvoyhdistelmän ajaessa mittauskohteen yli. Pohjan betonointimenetelmän koekohteena toimineella rummulla peitesyvyys on sitä vastoin niin suuri, että rumpuputkeen ylittävästä ajoneuvosta mobilisoituvat muodonmuutokset jäävät oletettavasti merkityksettömän pieniksi. Tästä johtuen kyseiseltä koekohteelta kerätyt havainnot rajoittuvat pelkästään korjausrakenteen periaatteen ja toteutuksen dokumentointiin. Niitä kahta koekohdetta, joilla tehtiin mittauksia, tarkasteltiin myös tarkemmin elementtimenetelmään perustuvien mallien avulla.

Kaikki tutkimukseen valikoituneet korjausmenetelmät osoittautuivat rakennettujen koekohteiden perusteella toteuttamiskelpoisiksi. Kahdessa kohteessa kuormituskokeiden perusteella saatujen mittaustulosten perusteella korjausmenetelmät arvioitiin myös rummun mekaanisen toiminnan kannalta toimiviksi ratkaisuiksi. Mittausten avulla todennetut jännitys- ja muodonmuutostasot jäivät verrattain maltillisiksi, vaikka rummun peitesyvyys oli koekohteissa melko pieni.

Aiemmissa rumpuputken mekaanisen toiminnan mallinnuksissa käytetyn PLAXIS 3D-ohjelmiston rinnalla mallinnettiin tässä tutkimuksessa rumpuputkeen syntyviä rasituksia tarkemmin myös ANSYS-ohjelmistolla. Tämän osalta todettiin, että korjatun rumpuputken mekaanista käyttäytymistä ei saatu verifioitua uskottaviksi arvioiduilla materiaaliparametreilla. Suurin yksittäinen laskennallista virhettä aiheuttava tekijä oli ANSYS-ohjelmistossa käytössä ollut materiaalimalli, joka

mahdollisti vetojännitysten syntymisen sitomattomiin tien rakennekerroksiin. Tällöin liikennekuormitus ei vaikuta etenkään tierakenteen syvyyssuunnassa tarpeeksi suurena, ja myös rummun yläpintaa rasittava puristusjännitys jää laskentamalleissa liian pieneksi. Tulevia korjausratkaisuja ei siis tutkimuksen tulosten perusteella pystytä verifioimaan pelkästään laskennallisesti tässä tutkimuksessa käytetyllä lähestymistavalla, mikäli rajaudutaan uskottaviksi arvioituihin materiaaliparametreihin tien rakennekerrosten ja pohjamaan osalta. Näin ollen laskennallisten parametrien määrittämisen tueksi tarvitaan tarkempia tietoja joko rumpuputken käyttäytymisestä tai rumpa ympäröivistä maakerroksista.

General information
Publication status: Published
MoE publication type: D5 Text book, professional manual or guide or a dictionary
Organisations: Department of Civil Engineering, Research group: Earth Constructions, Research group: Structural Mechanics, Research area: Infrastructure Construction
Contributors: Kalliainen, A., Haakana, V., Korhonen, M., Mäkinen, J., Kolisoja, P.
Number of pages: 70
Publication date: 2016

Publication information
Publisher: Liikennevirasto
ISBN (Electronic): 978-952-317-268-5
Original language: English

Publication series
Name: Liikenneviraston tutkimuksia ja selvityksiä
ISSN (Electronic): 1798-6656
URLs:

http://www2.liikennevirasto.fi/julkaisut/pdf8/lts_2016-26_terasrumpujen_uudet_web.pdf
Research output: Book/Report › Book › Professional

Testattua tahdistusta

General information
Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L.
Pages: 24-26
Publication date: 2012
Peer-reviewed: Unknown

Publication information
Journal: Sähkö & Tele
Volume: 85
Issue number: 3
Original language: Finnish

Bibliographical note
Contribution: organisation=epr,FACT1=1
Publisher name: Sähköinsinööriliitto ry; Fin-El Oy
Source: researchoutputwizard
Source ID: 4528
Research output: Contribution to journal › Article › Professional

Testing activity-based costing to large-scale combined heat and power plant using bioenergy

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Korpunen, H., Raiko, R.
Number of pages: 11
Pages: 1-11
Publication date: 2013
Peer-reviewed: Yes

Publication information
Journal: International Journal of Energy Research

ISSN (Print): 0363-907X
Ratings:

Scopus rating (2013): CiteScore 4.2 SJR 1.043 SNIP 1.666
Original language: English
DOIs:

10.1002/er.3047

Bibliographical note
ei vielä UT 2013-09-19 : This article was published online on [29 April 2013].Errors were subsequently identified in Table V.This notice is included in the online and print versions to indicate that both have been corrected [14 June 2013]
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-09-29
Publisher name: John Wiley & Sons Ltd.
Source: researchoutputwizard
Source ID: 2622
Research output: Contribution to journal › Article › Scientific › peer-review

Test in scala reale su argille sensibili: l'esperienza finlandese

General information
Publication status: Published
MoE publication type: D3 Professional conference proceedings
Organisations: Department of Civil Engineering, Research group: Foundation Structures
Contributors: D'Ignazio, M.
Publication date: May 2015

Host publication information
Title of host publication: 5 IAGIG, Incontro Annuale dei Giovani Ingegneri Geotecnici
Place of publication: Rome
URLs:

http://www.iagig.unisa.it/iagig_2015/iagig2015atti
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Professional

The application of HPLC-SEC for the simultaneous characterization of NOM and nitrate in well waters

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Szabo, H., Tuhkanen, T.
Pages: 779-786
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Chemosphere
Volume: 80
Issue number: 7
ISSN (Print): 0045-6535
Ratings:

Scopus rating (2010): SJR 1.879 SNIP 1.432
Original language: English
DOIs:

10.1016/j.chemosphere.2010.05.007

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 9356
Research output: Contribution to journal › Article › Scientific › peer-review

The Challenge of Aging Infrastructure, Aging Staff and Reflections for Education and Research

General information

Publication status: Published
Organisations: Department of Civil Engineering
Contributors: Katko, T. S.
Publication date: 12 Aug 2014
Peer-reviewed: Unknown
Event: Paper presented at 3rd UNECWAS Seminar "Water Services in Development and Society", .
URLs:
http://www.tut.fi/fi/tietoa-yliopistosta/uutiset-ja-tapahtumat/tapahtumat/3rd-unecwas-seminar-water-services-in-development-and-society-p072916
Research output: Other conference contribution › Paper, poster or abstract › Scientific

The designing and the implementation of WWW-course &wuot;Electricity, Electronics and Environment&wuot;

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L., Koskiranta, M., Lehtelä, R., Vesapuisto, M., Tepsa, K., Puro, H.
Pages: 75-78
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Elektronika ir Elektrotechnika
Volume: 102
Issue number: 6
ISSN (Print): 1392-1215
Ratings:
Scopus rating (2010): SJR 0.216 SNIP 0.329
Original language: English
URLs:
http://www.ktu.lt/lt/mokslas/zurnalai/meniu.asp

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 8436
Research output: Contribution to journal › Article › Scientific › peer-review

The doors of operating devices mitigation influence to the electric field exposure at 110kV substation tasks on service platforms

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Pääkkönen, R., Lahtinen, S., Korpinen, L.
Pages: 2 p
Publication date: 2011

Host publication information
Title of host publication: 10th International Conference European Bioelectromagnetics Association, 21-24 February 2011, Rome, Italy
Place of publication: Rome
Publisher: European Bioelectromagnetics Association

Publication series
Name: International Conference European Bioelectromagnetics Association
Publisher: European Bioelectromagnetics Association

Bibliographical note
ei ut-numeroa 26.4.2014
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 6939

Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

The effect of anode potential on bioelectrochemical and electrochemical tetrathionate degradation

The effect of poised anode potential on electricity production and tetrathionate degradation was studied in two-chamber flow-through electrochemical (ES) and bioelectrochemical systems (BES). The minimum anode potential (vs. Ag/AgCl) for positive current generation was 0.3 V in BES and 0.5 V in the abiotic ES. The anode potential required to obtain average current density above 70 mA m-2 was 0.4 V in BES and above 0.7 V in ES. ES provided higher coulombic efficiency, but the average tetrathionate degradation rate remained significantly higher in BES (above 110 mg L-1 d-1) than in the abiotic ES (below 35 mg L-1 d-1). This study shows that at anode potentials below 0.7 V, the electrochemical tetrathionate degradation is only efficient with microbial catalyst and that significantly higher tetrathionate degradation rates can be obtained with bioelectrochemical systems than with electrochemical systems at the tested anode potentials.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Contributors: L.K. Sulonen, M., Lakaniemi, A., Kokko, M. E., Puhakka, J. A.
Number of pages: 8
Pages: 173-180
Publication date: Feb 2017
Peer-reviewed: Yes
Early online date: 8 Dec 2016

Publication information

Journal: Bioresource Technology
Volume: 226
ISSN (Print): 0960-8524
Ratings:

Scopus rating (2017): CiteScore 10 SJR 2.029 SNIP 1.84
Original language: English
Keywords: Bioelectrochemical cell, Electrochemical cell, Tetrathionate, Anode potential, Current generation
Electronic versions:

Author's post print. Embargo ended: 8/12/18
DOIs:

10.1016/j.biortech.2016.12.023
URLs:

http://urn.fi/URN:NBN:fi:tty-201702021095. Embargo ended: 8/12/18
Source: RIS
Source ID: urn:6A72F358ABAE0BB9DC836F7776FCED75
Research output: Contribution to journal › Article › Scientific › peer-review

The effect of climate change on freeze-thaw durability of concrete structures in Finland

Lahdensivu presented in his Doctoral Thesis (Durability Properties and Actual Deterioration of Finnish Concrete Facades and Balconies, 2012) that without proper air-entrainment outdoor concrete structures have needed average of 307 freeze-thaw cycles (threshold value: t ≤ -5 °C) after a rain event in southern Finland and 388 cycles in inland for incipient freeze-thaw damage to occur. The difference between figures can be explained by the greater amount of wind-driven rain (WDR) before the freeze-thaw cycle on coastal areas.
As a consequence of climate change it has been shown that by the end of the century, the amount of WDR is going to increase 30 % at southern Finland and 40 % at inland. At the same time the amount of freeze-thaw cycles after a rain event are decreasing significantly at both locations which indicates freeze-thaw durability-wise longer service life for outdoor concrete structures. However, the latest studies show that while the amount of freeze-thaw cycles is decreasing, the amount of WDR before the cycles is also increasing significantly.
The WDR at winter time in Finland is highly orientated on west to south-east directions which can be seen also by the degradation rate observations of concrete facades and balconies based on condition assessments. In this study, the changes at WDR before the freeze-thaw events and the effect of climate change on them depending on the structure orientation are calculated to estimate the changes of climatic stress level on outdoor concrete structures.

General information

Publication status: Published
Organisations: Department of Civil Engineering, Research group: Service Life Engineering of Structures, Tampere University of Technology
Contributors: Pakkala, T., Lemberg, A., Lahdensivu, J.
Number of pages: 1

Pages: 53
Publication date: Jun 2016
Peer-reviewed: Unknown
Event: Paper presented at OCEANEXT : Interdisciplinary Conference, .
ASJC Scopus subject areas: Civil and Structural Engineering
Keywords: Freeze/thaw, Concrete, Wind-driven rain, Service life
URLs:

https://oceanext.sciencesconf.org/?lang=en

https://oceanext.sciencesconf.org/93828/document

Bibliographical note
INT=rak,"Lemberg, Antti-Matti"
Research output: Other conference contribution › Paper, poster or abstract › Scientific

The effect of lake bottom sediment layers on radionuclide transport from bedrock to biosphere and doses to humans

General information
Publication status: Published
Organisations: Pori, Research group: Data-analytics and Optimization
Contributors: Pohjola, J., Turunen, J., Lipping, T.
Number of pages: 2
Pages: 439-440
Publication date: 3 Sep 2017
Peer-reviewed: Unknown
Event: Paper presented at 4th International Conference on Radioecology & Environmental Radioactivity, Berlin, Germany.
ASJC Scopus subject areas: Computer Science Applications

Bibliographical note
Abstracts Book ISBN: 978-2-9545237-7-4
Research output: Other conference contribution › Paper, poster or abstract › Scientific

The Effect of Phosphorus Exposure on Diesel Oxidation Catalysts-Part I: Activity Measurements, Elementary and Surface Analyses
The effects of phosphorus poisoning on the activity of PtPd and Pt diesel oxidation catalysts and on the activity of the support material were investigated using the gas phase laboratory-scale-aging procedure. The catalysts were treated using two different phosphorus concentrations (0.065 and 0.13 mol/L (NH4)(2)HPO). The deactivation was studied by inductively coupled plasma optical emission spectroscopy, electron microscopy, X-ray diffractometry, X-ray photoelectron spectrometry and Fourier-transform infrared reflectance, N-2-physisorption, and activity measurements with CO, C3H6 and NO. The amount of accumulated phosphorus was higher on the Pt catalyst surface than on the PtPd catalyst and significantly higher on the surface of the bare support material. Phosphorus concentration was uniform throughout the support layer (down to the 10 mu m), and phosphorus was found as phosphate, although it can also form compounds like AlPO(4) with the support. The treatment with low phosphorus concentration was found to have a clear deactivation effect only for C3H6 oxidation activity on PtPd catalysts above 200 degrees C. The treatment with high phosphorus concentration significantly decreased the activity of both the PtPd and Pt catalysts. In particular, the C3H6 and NO oxidation activities of the fresh and P-treated Pt catalysts were higher than those of the PtPd catalysts for the entire temperature range.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Materials Science, Research group: Materials Characterization, Univ Oulu, University of Oulu, Fac Technol, Environm & Chem Engn, Aalto University, Dinex Ecocat Oy, Catalyst Res
Contributors: Kärkkäinen, M., Kolli, T., Honkanen, M., Heikkinen, O., Huuhtanen, M., Kallinen, K., Lepistö, T., Lahtinen, J., Vippola, M., Keiski, R. L.
Number of pages: 10
Pages: 961-970
Publication date: Oct 2015
Peer-reviewed: Yes

Publication information
Journal: Topics in Catalysis
Volume: 58
Issue number: 14
ISSN (Print): 1022-5528
Ratings:

Scopus rating (2015): CiteScore 4.7 SJR 0.926 SNIP 0.777
Original language: English
Keywords: Phosphorus, Deactivation, Poisoning, Diesel oxidation catalyst, Platinum, Palladium, NO OXIDATION, THERMAL-STABILITY, DEACTIVATION, REDUCTION, MECHANISMS, BEHAVIOR, EXHAUST
DOIs:

10.1007/s11244-015-0464-z
Source: WOS
Source ID: 000362581900016
Research output: Contribution to journal › Article › Scientific › peer-review

The Effect of Phosphorus Exposure on Diesel Oxidation Catalysts-Part II: Characterization of Structural Changes by Transmission Electron Microscopy

Phosphorus poisoning and its effect on the diesel oxidation catalysts morphology was studied by transmission electron microscopy (TEM). The studied catalyst samples were PtPd or Pt supported on the alumina-based washcoat including additives. The laboratory-scale phosphorus exposures were carried out with two different phosphorus concentrations. The cross-sectional TEM samples were prepared from the fresh and phosphorus-treated catalysts. After phosphorus exposures, significant structural changes were observed compared to the fresh catalysts. The shape of the noble metal particles had changed from irregular to more spherical-shaped particles. In addition, phosphorus was detected throughout the catalyst TEM samples but the amount varied depending on the local composition of the support. Phosphorus accumulated mainly in the alumina-containing areas of the support and indications of dense and amorphous aluminium phosphates were found. Based on the results gained, cross-sectional TEM characterization is essential to observe these kinds of morphological changes in the catalysts caused e.g. by phosphorus exposures. In addition, cross-sectional TEM samples are needed to study the effect of local variation in the support composition on the phosphorus accumulation.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Materials Science, Research group: Materials Characterization, Univ Oulu, University of Oulu, Fac Technol Mass & Heat Transfer Proc Engn, Aalto University, Dinex Ecocat Oy
Contributors: Honkanen, M., Kärkkäinen, M., Heikkinen, O., Kallinen, K., Kolli, T., Huuhtanen, M., Lahtinen, J., Keiski, R. L., Lepistö, T., Vippola, M.
Number of pages: 6
Pages: 971-976
Publication date: Oct 2015
Peer-reviewed: Yes

Publication information

Journal: Topics in Catalysis
Volume: 58
Issue number: 14
ISSN (Print): 1022-5528
Ratings:

Scopus rating (2015): CiteScore 4.7 SJR 0.926 SNIP 0.777
Original language: English
Keywords: Diesel oxidation catalyst, Phosphorus poisoning, Structural characterization, Transmission electron microscopy , 3-WAY CATALYST, DEACTIVATION, MECHANISMS, EXHAUST, IMPACT
Electronic versions:

Honkanen et al_accepted manuscript
DOIs:

10.1007/s11244-015-0465-y
URLs:

http://urn.fi/URN:NBN:fi:tty-201710182015
Source: WOS
Source ID: 000362581900017
Research output: Contribution to journal › Article › Scientific › peer-review

The effect of torrefaction on the chlorine content and heating value of eight woody biomass samples

This study examined and compared the effect of torrefaction on the heating value, elementary composition, and chlorine content of eight woody biomasses. The biomass samples were torrefied in a specially constructed batch reactor at 260 °C for 30, 60, and 90 min. The original biomasses as well as the solid, liquid, and gaseous torrefaction reaction products were analyzed separately. The higher heating values (HHV) of dry samples increased from 19.5–21.0 MJ kg^{-1} to 21.2–23.2 MJ kg^{-1} during 60 min of torrefaction. In all samples, the HHV increased 9 % on average. Furthermore, the effect of torrefaction time on the biomass HHV was studied. Measurements showed that after a certain point, increasing the torrefaction time had no effect on the samples' HHV. This optimal torrefaction time varied considerably between the

samples. For more reactive biomasses, i.e., birch and aspen, the optimal torrefaction time was close 30 min whereas the HHV of less reactive biomasses, e.g., stumps, increased markedly even after a 60-min torrefaction. Another significant observation was that torrefaction reduced the chlorine content of the biomass samples. The chlorine concentration of the solid product dropped in most samples from the original by half or even as much as 90 %. The highest relative chlorine decrease was observed in the Eucalyptus dunnii sample, which also had the highest chlorine content of all the studied biomasses. The relative carbon content of the biomass samples increased during torrefaction as the average elementary composition changed from $CH_{0.123}O_{0.827}$ to $CH_{0.105}O_{0.674}$ after a 60-min torrefaction.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Power Plant and Combustion Technology, Urban circular bioeconomy (UrCirBio)
Contributors: Keipi, T., Tolvanen, H., Kokko, L., Raiko, R.
Number of pages: 8
Pages: 232-239
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Biomass & Bioenergy
Volume: 66
ISSN (Print): 0961-9534
Ratings:
Scopus rating (2014): CiteScore 7.3 SJR 1.865 SNIP 1.973
Original language: English
DOIs:
10.1016/j.biombioe.2014.02.015

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-05-28
Publisher name: Pergamon; Imprint: Elsevier
Source: researchoutputwizard
Source ID: 698
Research output: Contribution to journal › Article › Scientific › peer-review

The effects of improved energy efficiency on indoor environmental quality in multi-family buildings

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Research group: Concrete and Bridge Structures, Research area: Structural Engineering, Department of Civil Engineering, Research group: Building Physics, Natl Inst Hlth & Welf, Finland National Institute for Health & Welfare, Dept Environm Hlth, Kaunas Univ Technol, Kaunas University of Technology, Dept Environm Technol
Contributors: Du, L., Prasauskas, T., Leivo, V., Turunen, M., Kiviste, M., Martuzevicius, D., Haverinen-Shaughnessy, U.
Publication date: 2016

Host publication information
Title of host publication: Indoor Air 2016 : The 14th international conference of Indoor Air Quality and Climate Ghent, Belgium July 3-8 2016
Article number: 737
ISBN (Electronic): 978-0-9846855-5-4
URLs:
http://www.indoorair2016.org/
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

The evolving role of water co-operatives in Finland

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Takala, A. J., Arvonen, V., Katko, T. S., Pietilä, P. E., Åkerman, M. W.
Pages: 11-19

Publication date: 2011
Peer-reviewed: Yes

Publication information
Journal: International Journal of Co-Operative Management
Volume: 5
Issue number: 2
ISSN (Print): 1741-4814
Original language: English

Bibliographical note
ei ut-numeroa 17.5.2014
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 7349
Research output: Contribution to journal › Article › Scientific › peer-review

The experiences of technical university students on an "environmental health" course

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Gonzalez-Sosa, J., Korpinen, L.
Pages: 1586-1592
Publication date: 2012

Host publication information
Title of host publication: EDULEARN12 Proceedings, 4th International Conference on Education and New Learning Technologies, 2-4 July, 2012, Barcelona, Spain
Place of publication: Barcelona
Publisher: International Association of Technology, Education and Development IATED
Editors: Gomez Chova, L., Candel Torres, I., Lopez Martinez, A.
ISBN (Print): 978-84-695-3491-5

Publication series
Name: International Conference on Education and New Learning Technologies

Bibliographical note
ei ut-numeroa 13.8.2013
Contribution: organisation=epr,FACT1=1
Publisher name: International Association of Technology, Education and Development IATED
Source: researchoutputwizard
Source ID: 4103
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

The factors controlling combustion and gasification kinetics of solid fuels

General information
Publication status: Published
MoE publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Energy and Process Engineering
Contributors: Tolvanen, H., Kokko, L., Raiko, R.
Number of pages: 14
Pages: 1-14
Publication date: 2011

Host publication information
Title of host publication: Swedish-Finnish Flame Days, "Challenges in Combustion Technology today", January 26-27, 2011, Sweden
Place of publication: Piteå
Publisher: IFRF and the Scandinavian-Nordic Section of the Combustion Institute

Publication series
Name: Swedish-Finnish Flame Days
Publisher: IFRF and the Scandinavian-Nordic Section of the Combustion Institute

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 7395
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific

The Fountain A Harbinger of a New Era in Case Tampere

General information
Publication status: Published
MoE publication type: B2 Part of a book or another research book
Organisations: School of Architecture, Department of Chemistry and Bioengineering, Former organisation of the author
Contributors: Hynynen, A., Juuti, P., Katko, T.
Pages: 63-70
Publication date: 2011

Host publication information
Title of host publication: Water Fountains in the Cityscape. Essays in Public Works History
Place of publication: Kansas City,MO
Publisher: Public Works Historical Society
Editors: Hynynen, A. J., Juuti, P. S., Katko, T. S.
ISBN (Print): 978-1-60675-029-2

Publication series
Name: Essays in Public Works History
Publisher: Public Works Historical Society
Volume: 30
ISSN (Print): 1047-5257

Bibliographical note
ei ut-numeroa 15.3.2014
Contribution: organisation=ark ays,FACT1=0.33
Contribution: organisation=keb bio,FACT2=0.67
Source: researchoutputwizard
Source ID: 6156
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific

The Mermaid of Helsinki, Finland

General information
Publication status: Published
MoE publication type: B2 Part of a book or another research book
Organisations: School of Architecture, Department of Chemistry and Bioengineering, Former organisation of the author
Contributors: Hynynen, A. J., Juuti, P. S., Katko, T. S.
Number of pages: 5
Pages: 107-111
Publication date: 2012

Host publication information
Title of host publication: Water Fountains in the Worldscape
Place of publication: Kangasala
Publisher: International Water History Association and Kehrämedia Inc.
Editors: Ari, J. H., Petri, S. J., Tapio, S. K.
ISBN (Print): 978-951-98151-8-3

Bibliographical note
Ei UT-numeroa 14.8.2013
Contribution: organisation=ark ays,FACT1=0.5
Contribution: organisation=keb bio,FACT2=0.5
Source: researchoutputwizard
Source ID: 4281
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific

The most difficult at-fault fatal crashes to avoid with current active safety technology
Objective: We studied which current fatal at-fault crashes would occur despite the most advanced current active safety devices (up to SAE level 2 of driving automation) and how frequent these crashes would be.
Methods: We carried out a cross-sectional study of passenger cars that were first registered during the period 1st January

2010 to 31st December 2017 in Finland. To gain the true exposure for these cars, we accessed the national Vehicular and Driver Data Register to obtain the mileage information and the registration count for the study period of 2010-17. Similarly, we accessed the registry of Finnish road accident investigation teams and included all fatal at-fault crashes among the cars in our study for the same period. We used a real world reference technology for each active safety system in our analysis and chose one car brand as an example. This gave us exact system specifications and enabled testing the operation of the systems on the road. We performed field tests to gain further information on the precise operation of the safety systems in different operating conditions. Finally, we gathered all information on the studied active safety systems and analyzed the investigated at-fault fatal crashes case-by-case using our four level method.
Results: Cars in our study were the primary party in 113 investigated fatal accidents during the years 2010-17. In 87 of the accidents, the leading cause of death was the injuries due to the crash, and these cases were classified as “unavoidable” (n = 58, 67 %), “avoidable” (n = 26, 30 %) or unsolved (n = 3, 3 %). Of the 58 “unavoidable” crashes 21 (36 %) were suicides, 21 (36%) involved active driver input which would have prevented the safety system operation, 15 (17 %) featured circumstances beyond the safety system performance and in one loss-of-control crash the driver had disabled the relevant safety system (electronic stability control). The registration years of the cars in our study (2010-17) totaled 3,772,864 and during this period, the cars travelled 75.9 billion kilometers. The crash incidence of the “unavoidable” at-fault fatal crashes was 0.76-0.80 fatal crashes per billion kilometers and 15-16 fatal crashes per million registration years.
Conclusions: We calculated a crash incidence for the “unavoidable” crashes which was 20–27% smaller than the observed crash rate of ESC-fitted passenger cars in our previous study. We concluded that suicides, active driver input until the crash, and challenging weather and road conditions are the most difficult factors for current active safety systems. Our analysis did not account for issues such as system usability or driver acceptance and therefore our results should be regarded as something that is currently theoretically achievable. However, the observed incidence is a good reference for automated driving development and the crash rate of automated cars.

General information
Publication status: E-pub ahead of print
MoE publication type: A1 Journal article-refereed
Organisations: Civil Engineering, Research group: Transport Research Centre Verne, Aalto University, Helsinki University , Finnish Crash Data Institute
Contributors: Koisaari, T., Utriainen, R., Kari, T., Tervo, T.
Publication date: 13 Dec 2019
Peer-reviewed: Yes

Publication information
Journal: Accident Analysis and Prevention
Volume: 135
Issue number: 2020
Article number: 105396
ISSN (Print): 0001-4575
Ratings:

Scopus rating (2019): CiteScore 6.4 SJR 1.69 SNIP 2.296
Original language: English
DOIs:

10.1016/j.aap.2019.105396
Research output: Contribution to journal › Article › Scientific › peer-review

The need for “champions” in rural water supply

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Bio- ja ympäristötekniikka
Contributors: Katko, T. S.
Pages: 19-22
Publication date: 1994
Peer-reviewed: Yes

Publication information
Journal: Waterlines
Volume: 12
Issue number: 3
Original language: English
Research output: Contribution to journal › Article › Scientific › peer-review

The Possible Exposure of Children to Extremely Low Frequency Magnetic Fields in the Home

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Gobba, F., Pääkkönen, R., Tarao, H., Korpinen, L.
Pages: 286-288
Publication date: 2012

Host publication information
Title of host publication: PIERS 2012 Moscow Proceedings, August 19-23, 2012, Moscow, Russia
Publisher: Electromagnetics Academy
ISBN (Print): 978-1-934142-22-6

Publication series
Name: Progress in Electromagnetics Research Symposium
ISSN (Print): 1559-9450
URLs:

http://www.piers.org

Bibliographical note
ei ut-numeroa 13.8.2013
Contribution: organisation=epr,FACT1=1
Publisher name: Electromagnetics Academy
Source: researchoutputwizard
Source ID: 4093
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

The potential of biomethane in replacing fossil fuels in heavy transport-a case study on Finland

Electrification is a frequently discussed solution for reducing transport related carbon dioxide emissions. However, transport sectors such as aviation and heavy-duty vehicles remain dependent on on-board fuels. Here, biomethane is still a little exploited solution, and the case of heavy-duty vehicles is particularly underappreciated despite the recent technical advances and potentially notable emission reductions. This paper discusses the potential of biomethane in heavy-duty road transport in the case of Finland, where the utilization rate is low compared to the technical potential. To this end, the potential of biomethane production through both anaerobic digestion and gasification was calculated in three scenarios for the heavy-duty transport fleet, based on the literature values of biomethane potential and truck class fuel consumption. The authors find that approximately half of the heavy-duty transport in Finland could be biomethane fueled by 2030. The estimated production costs for biomethane (81-190 €/MWh) would be competitive with the current consumer diesel price (152 €/MWh). Utilizing the total biomethane potential in heavy-duty transport would furthermore decrease the respective carbon dioxide emissions by 50%. To accelerate the transition in the heavy-duty transport sector, a more comprehensive political framework is needed, taking into account both production and consumption.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Research group: Bio- and Circular Economy, Materials Science and Environmental Engineering, MAB Powertec Oy, Tampere University
Contributors: Pääkkönen, A., Aro, K., Aalto, P., Konttinen, J., Kojo, M.
Publication date: 1 Sep 2019
Peer-reviewed: Yes

Publication information
Journal: Sustainability
Volume: 11
Issue number: 17
Article number: 4750
ISSN (Print): 2071-1050
Ratings:

Scopus rating (2019): CiteScore 3.2 SJR 0.581 SNIP 1.165
Original language: English
ASJC Scopus subject areas: Geography, Planning and Development, Renewable Energy, Sustainability and the Environment, Management, Monitoring, Policy and Law
Keywords: Anaerobic digestion, Biomethane, Carbon emission reduction, Finland, Heavy-duty transport, Renewable transport fuels, Transition, Wood gasification
Electronic versions:

sustainability-11-04750-v2

DOIs:
10.3390/su11174750
URLs:
http://urn.fi/URN:NBN:fi:tuni-201909193417
Source: Scopus
Source ID: 85071977101
Research output: Contribution to journal › Article › Scientific › peer-review

The potential of electric trucks – An international commodity-level analysis

Development of battery technology is making battery electric heavy duty trucks technically and commercially viable and several manufacturers have introduced battery electric trucks recently. However, the national and sectoral differences in freight transport operations affect the viability of electric trucks. The aim of this paper is to develop a methodology for estimating the potential of electric trucks and demonstrate the results in Switzerland and Finland. Commodity-level analysis of the continuous road freight survey data were carried out in both countries. As much as 71% of Swiss road freight transport tonne-kilometers may be electrified using battery electric trucks but Finland has very limited potential of 35%, due to the use of long and heavy truck-trailer combinations. Within both countries the electrification potential varies considerably between commodities, although in Finland more so than in Switzerland. Commodities which are constrained by payload volume rather than weight and are to large extent carried using medium duty or <26t rigid trucks trucks seem to provide high potential for electrification even with the current technology. Electric trucks increase the annual electricity consumption by only 1–3%, but truck charging is likely to have a large impact on local grids near logistics centres and rest stations along major roads. A spatial analysis by routing the trips reported in the datasets used in this study should be carried out. Future research should also include comparison between the alternate ways of electrifying road freight transport, i.e. batteries with charging, batteries with battery swapping and electrified road systems.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Research group: Transport Research Centre Verne, Civil Engineering, HCI e 486.1
Contributors: Liimatainen, H., van Vliet, O., Aplyn, D.
Number of pages: 11
Pages: 804-814
Publication date: 15 Feb 2019
Peer-reviewed: Yes
Early online date: 14 Dec 2018

Publication information

Journal: Applied Energy
Volume: 236
ISSN (Print): 0306-2619
Ratings:
Scopus rating (2019): CiteScore 16.4 SJR 3.607 SNIP 2.865
Original language: English
ASJC Scopus subject areas: Building and Construction, Energy(all), Mechanical Engineering, Management, Monitoring, Policy and Law
Keywords: Charging infrastructure, Electric trucks, Logistics, Road freight transport
Electronic versions:
1-s2.0-S0306261918318361-main
DOIs:
10.1016/j.apenergy.2018.12.017
URLs:
http://urn.fi/URN:NBN:fi:tty-201901081024
Source: Scopus
Source ID: 85058374379
Research output: Contribution to journal › Article › Scientific › peer-review

The role of inorganics in modelling of biomass gasification

In this work, a summary of the research carried out about the role of inorganic elements in biomass gasification is presented. The research work has focused on the catalytic effects of alkali and alkaline earth metals in char gasification. The work has included gasification experiments using thermogravimetric analysis (TGA) and fluidized beds as well as modeling techniques. The results of the research presented in this paper indicate that the laboratory measured TGA reactivity numbers and correlations (including the effect of fuel ash inorganics) are possible to be converted to numbers predicting carbon conversion in a large scale fluidized bed gasification reactor. The model, called Carbon Conversion Predictor, is a relatively simple and transparent tool for the comparison of the gasification reactivity of different fuels in fluidized bed gasification.

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Chemistry and Bioengineering, Research group: Bio- and Circular Economy, Univ Seville, University of Sevilla, Chem & Environm Engn Dept, Bioenergy Grp, Escuela Super Ingenieros, Åbo Akademi University, Process Chemistry Center
Contributors: Konttinen, J., Kramb, J., DeMartini, N., Gomez-Barea, A.
Number of pages: 5
Pages: 443-447
Publication date: 13 Jun 2017

Host publication information
Title of host publication: EUBCE 2017 Online Conference Proceedings
Publisher: ETA-Florence Renewable Energies
Editors: Ek, L., Ernrooth, H., Scarlat, N., Grassi, A., Helm, P.
ISBN (Electronic): 978-88-89407-17-2

Publication series
Name: European biomass conference and exhibition proceedings
Publisher: ETA Florence revewable energies
ISSN (Electronic): 2282-5819
DOIs:

10.5071/25thEUBCE2017-2BO.6.4
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

The students' feedback on WWW-course "Electricity, Electronics and Environment"

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Energy and Process Engineering
Contributors: Vesapuisto, M., Vekara, T., Korpinen, L., Koskiranta, M., Lehtelä, R.
Number of pages: 4
Pages: 99-102
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Elektronika ir Elektrotechnika
Volume: 102
Issue number: 6
ISSN (Print): 1392-1215
Ratings:

Scopus rating (2010): SJR 0.216 SNIP 0.329
Original language: English
URLs:

http://www.ktu.lt/lt/mokslas/zurnalai/meniu.asp

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 9548
Research output: Contribution to journal › Article › Scientific › peer-review

The technical students' feedback from the course issues on environmental health

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L., Lehtelä, R., Vesapuisto, M., Vekara, T.
Pages: 119-123
Publication date: 2011

Host publication information
Title of host publication: Proceedings of the 22nd EAEEIE Annual Conference - EAEEIE 2011, Maribor, Slovenia, June 13-15,2011
Place of publication: Maribor
Publisher: University of Maribor, Faculty of Electrical Engineering and Computer Science
ISBN (Print): 978-961-248-281-7

Publication series
Name: EAEEIE Annual Conference
Publisher: University of Maribor, Faculty of Electrical Engineering and Computer Science

Bibliographical note
ei ut-numeroa 22.3.2014
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 6420
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Tighter contracts or more trust? Outsourcing in Finnish water utilities

This article discusses the outsourcing of water utility operations and the prerequisites for successful partnerships between water utilities and external service providers. A questionnaire survey in Finland indicated that the outsourcing of various water utility operations will increase in the future. This trend includes great opportunities to utilize the best features of external service providers and efficiently develop the water services sector. However, the outsourcing also includes risks because there is a lack of trust between water utilities and private companies. Therefore, “hard,” rigid contracts are preferred to reduce the uncertainty in outsourcing such undertakings. In uncertain conditions, this approach may not be an effective and fruitful development path in the long term. If relationships are more trust based, uncertainty can actually strengthen these relationships. Thus, more attention should be paid to building trust instead of intensively attempting to reduce uncertainty.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Life Cycle Effectiveness of the Built Environment (LCE@BE)
Contributors: Heino, O., Katko, T. S., Pietilä, P. E.
Number of pages: 19
Pages: 360-378
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Public Works Management and Policy
Volume: 20
Issue number: 4
ISSN (Print): 1087-724X
Ratings:
Scopus rating (2015): CiteScore 0.9 SJR 0.242 SNIP 0.41
Original language: English
DOIs:
10.1177/1087724X14538237

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2014-12-12
Publisher name: Sage Publications, Inc.
Source: researchoutputwizard
Source ID: 441
Research output: Contribution to journal › Article › Scientific › peer-review

To fractionate municipal solid waste incineration bottom ash: Key for utilisation?

For the past decade, the Finnish waste sector has increasingly moved from the landfilling of municipal solid waste towards waste incineration. New challenges are faced with the growing amounts of municipal solid waste incineration bottom ash, which are mainly landfilled at the moment. Since this is not a sustainable or a profitable solution, finding different utilisation applications for the municipal solid waste incineration bottom ash is crucial. This study reports a comprehensive analysis of bottom ash properties from one waste incineration plant in Finland, which was first treated with a Dutch bottom ash recovery technique called advanced dry recovery. This novel process separates non-ferrous and ferrous metals from bottom ash, generating mineral fractions of different grain sizes (0–2 mm, 2–5 mm, 5–12 mm and 12–50 mm). The main aim of the study was to assess, whether the advanced bottom ash treatment technique, producing mineral fractions of different grain sizes and therefore properties, facilitates the utilisation of municipal solid waste incineration bottom ash in Finland. The results were encouraging; the bottom ash mineral fractions have favourable behaviour against the frost

action, which is especially useful in the Finnish conditions. In addition, the leaching of most hazardous substances did not restrict the utilisation of bottom ash, especially for the larger fractions (>5 mm). Overall, this study has shown that the advanced bottom ash recovering technique can be one solution to increase the utilisation of bottom ash and furthermore decrease its landfilling in Finland.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Suomen Erityisjäte Oy
Contributors: Sormunen, L. A., Rantsi, R.
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Waste Management and Research
ISSN (Print): 0734-242X
Ratings:
Scopus rating (2015): CiteScore 2.6 SJR 0.623 SNIP 0.918
Original language: English
DOIs:
10.1177/0734242X15600052
Research output: Contribution to journal › Article › Scientific › peer-review

Toimiva vesihuolto ei ole itsestäänselvyys.

General information
Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Civil Engineering
Contributors: Katko, T. S.
Number of pages: 1
Pages: 17
Publication date: Apr 2017
Peer-reviewed: Unknown

Publication information
Journal: Promaint
Volume: 29
Issue number: 2
ISSN (Print): 1797-2000
Original language: Finnish
Keywords: good governance , aging infrastructure
URLs:
https://issuu.com/promaintlehti/docs/promaint_2_2017
Research output: Contribution to journal › Article › Professional

Towards balanced public-private co-operation in urban water management

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Hukka, J. J., Katko, T. S., Pietilä, P. E., Seppälä, O. T.
Pages: 71-81
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Journal of Management & Public Policy
Volume: 2
Issue number: 1
ISSN (Print): 0976-013X
Original language: English

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 8110
Research output: Contribution to journal › Article › Scientific › peer-review

Towards bioproduction of poly-α-olefins from lignocellulose
Bioprocesses involving more than one species can alleviate restrictions posed by limited substrate range of single species. Coupled, multistage cultures can be useful when heterogeneous substrates, such as lignocellulosic biomass, are exploited. Here, microbial production of α-olefins (C11) from lignocellulosic substrates, namely cellulose and technical lignin, was investigated. A two-stage culture with cellulose fermentation to organic acids by Clostridium cellulolyticum and subsequent upgrading of the organic acids to 1-undecene by engineered Acinetobacter baylyi ADP1 was established. As a result, A. baylyi ADP1 synthesised 107 μg L-1 of 1-undecene from cellulose. Additionally, ligninolytic effects by A. baylyi ADP1 on softwood were confirmed and downstream processing for continuous 1-undecene collection was introduced. In addition, the synthesis of poly-α-olefin trimers (C33) by the oligomerization of 1-undecene was demonstrated. This study demonstrates the potential of integrated multistage processes in treating challenging substrates.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Materials Science and Environmental Engineering, Research group: Bio- and Circular Economy
Contributors: Salmela, M., Lehtinen, T., Efimova, E., Santala, S., Santala, V.
Number of pages: 10
Pages: 5067-5076
Publication date: 2020
Peer-reviewed: Yes

Publication information
Journal: Green Chemistry
Volume: 22
Issue number: 15
ISSN (Print): 1463-9262
Original language: English
ASJC Scopus subject areas: Environmental Chemistry, Pollution
Electronic versions:

Towards bioproduction of poly-α-olefins 2020
DOIs:

10.1039/d0gc01617a
URLs:

http://urn.fi/URN:NBN:fi:tuni-202008316780
Source: Scopus
Source ID: 85089692039
Research output: Contribution to journal › Article › Scientific › peer-review

Towards enhanced nutrient recovery, biogas production and upgrading through AD and BES integration

General information
Publication status: Published
MoE publication type: Not Eligible
Organisations: Materials Science and Environmental Engineering, University of Queensland
Contributors: Koskue, V., Ledezma, P., Freguia, S., Kokko, M.
Publication date: 24 Jun 2019
Peer-reviewed: Unknown
Event: Paper presented at 16th IWA World Conference on Anaerobic Digestion, Delft, Netherlands.
Research output: Other conference contribution › Paper, poster or abstract › Scientific

Towards the EU emissions targets of 2050: optimal energy renovation measures of Finnish apartment buildings
Member countries of the European Union have released targets to reduce carbon dioxide emissions by 80% by the year 2050. Energy use in buildings is a major source of these emissions, which is why this study focused on the cost-optimal renovation of Finnish apartment buildings. Apartment buildings from four different construction years (pre-1976, 1976–2002, 2003–2009 and post-2010) were modelled, using three different heating systems: district heating, ground-source heat pump and exhaust air heat pump. Multi-objective optimisation was utilised to find the most cost-effective energy renovation measures. Most cost-effective renovation measures were ground-source heat pumps, demand-based ventilation and solar electricity. Additional thermal insulation of walls was usually too expensive. By performing only the

cost-effective renovations, the emissions could be reduced by 80%, 82%, 69% and 68%, from the oldest to the newest buildings, respectively. This could be done with the initial investment cost of 296, 235, 115 and 104 €/m^2, respectively.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Civil Engineering, Aalto University, Nanjing Tech University
Contributors: Hirvonen, J., Jokisalo, J., Heljo, J., Kosonen, R.
Publication date: 2019
Peer-reviewed: Yes
Early online date: 2018

Publication information
Journal: International Journal of Sustainable Energy
Volume: 38
Issue number: 7
ISSN (Print): 1478-6451
Ratings:

Scopus rating (2019): CiteScore 3 SJR 0.427 SNIP 0.595
Original language: English
ASJC Scopus subject areas: Renewable Energy, Sustainability and the Environment, Fuel Technology, Energy(all), Process Chemistry and Technology, Fluid Flow and Transfer Processes
Keywords: apartment building, Cost-optimal renovation, energy performance, greenhouse gas emissions, multi-objective optimisation
DOIs:

10.1080/14786451.2018.1559164
Source: Scopus
Source ID: 85058681434
Research output: Contribution to journal › Article › Scientific › peer-review

Transient–state operation of an anoxic biotrickling filter for H2S removal
The application of an anoxic biotrickling filter (BTF) for H2S removal from contaminated gas streams is a promising technology for simultaneous H2S and NO3− removal. Three transient–state conditions, i.e. different liquid flow rates, wet–dry bed operations and H2S shock loads, were applied to a laboratory–scale anoxic BTF. In addition, bioaugmentation of the BTF with a H2S removing–strain, Paracoccus MAL 1HM19, to enhance the biomass stability was investigated. Liquid flow rates (120, 60 and 30 L d−1) affected the pH and NO3− removal efficiency (RE) in the liquid phase. Wet–dry bed operations at 2–2 h and 24–24 h reduced the H2S elimination capacity (EC) by 60–80%, while the operations at 1–1 h and 12–12 h had a lower effect on the BTF performance. When the BTF was subjected to H2S shock loads by instantly increasing the gas flow rate (from 60 to 200 L h−1) and H2S inlet concentration (from 112 (± 15) to 947 (± 151) ppmv), the BTF still showed a good H2S RE (>93%, EC of 37.8 g S m–3 h–1). Bioaugmentation with Paracoccus MAL 1HM19 enhanced the oxidation of the accumulated S0 to sulfate in the anoxic BTF.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Materials Science and Environmental Engineering, Department of Civil, Architectural and Environmental Engineering (DICEA), University of Naples Federico II, Wageningen University and the UNESCO-IHE Institute for Water Education, Delft, The Netherlands, 18.10.2013, Hydraulic and Environmental Engineering (IHE) Inst. for Water Education
Contributors: Khanongnuch, R., Di Capua, F., Lakaniemi, A., Rene, E. R., Lens, P.
Number of pages: 10
Pages: 42-51
Publication date: 5 Sep 2019
Peer-reviewed: Yes

Publication information
Journal: Journal of Hazardous Materials
Volume: 377
ISSN (Print): 0304-3894
Ratings:

Scopus rating (2019): CiteScore 13.1 SJR 2.01 SNIP 2.159
Original language: English
DOIs:

10.1016/j.jhazmat.2019.05.043
URLs:

http://urn.fi/URN:NBN:fi:tty-201906171892. Embargo ends: 26/05/21

Research output: Contribution to journal › Article › Scientific › peer-review

Treatment of Composted Soils contaminated with Petroleum Hydrocarbons using Chemical Oxidation followed by Enhanced Aerobic Bioremediation

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Contributors: Cajal-Marinosa, P., Reich, O., Mobes, A., Tuhkanen, T.
Pages: 217-223
Publication date: 2012
Peer-reviewed: Yes

Publication information
Journal: Journal of Advanced Oxidation Technologies
Volume: 15
Issue number: 1
ISSN (Print): 1203-8407
Ratings:

Scopus rating (2012): CiteScore 1.4 SJR 0.408 SNIP 0.495
Original language: English

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Publisher name: Science & Technology Integration
Source: researchoutputwizard
Source ID: 3952
Research output: Contribution to journal › Article › Scientific › peer-review

TTY:ssä panostetaan pakkausalaan

General information
Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Department of Energy and Process Engineering
Contributors: Kuusipalo, J., Lahti, J.
Pages: 35-35
Publication date: 2010
Peer-reviewed: Unknown

Publication information
Journal: Pakkaus
Issue number: 5
ISSN (Print): 0031-0131
Original language: Finnish

Bibliographical note
Contribution: organisation=epr pap,FACT1=1
Source: researchoutputwizard
Source ID: 8500
Research output: Contribution to journal › Article › Professional

Tulevaisuuden vesiosaajat

General information
Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Department of Chemistry and Bioengineering
Contributors: Takala, A., Heinonen, U., Innala, T., Lundgren, K., Mattila, H., Vahala, R., Vuola, S.
Pages: 6-7
Publication date: 2012
Peer-reviewed: No

Publication information

Journal: Vesitalous
Volume: 53
Issue number: 3
ISSN (Print): 0505-3838
Original language: Finnish
URLs:
http://www.vesitalous.fi

Bibliographical note
Contribution: organisation=keb bio,FACT1=1
Publisher name: Talotekniikka-Julkaisut Oy yhteistyössä Suomen Vesiyhdistys ry.
Source: researchoutputwizard
Source ID: 5387
Research output: Contribution to journal › Article › Scientific

Tuli: Pelko ja pelastus

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, University of Tampere
Contributors: Juuti, P., Rajala, R., Katko, T. S.
Pages: 47-64
Publication date: 2009

Host publication information
Title of host publication: Elämän virta : Kajaanin veden historia
Publisher: TamPub
Editors: Juuti, P., Rajala, R., Katko, T.
ISBN (Print): 978-951-800-320-8
ISBN (Electronic): 978-951-44-7657-0
URLs:
http://urn.fi/urn:isbn:978-951-44-7657-0
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Tuotanto- ja operointi-innovaatiot - case vesihuolto

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering
Contributors: Heino, O.
Number of pages: 19
Pages: 120-138
Publication date: 2013

Host publication information
Title of host publication: Huomispäivän infrastruktuuri. Kuntaliiton verkkojulkaisu. Acta 240
Publisher: Suomen Kuntaliitto
Editors: Malinen, P., Anttiroiko, A., Haahtela, T., Siitonen, P.
ISBN (Print): 978-952-213-915-3
ISBN (Electronic): 978-952-213-916-0
URLs:
http://shop.kunnat.net/download.php?filename=uploads/acta240_sisaltoebook.pdf

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-07-29
Source: researchoutputwizard
Source ID: 2271
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Turning up the heat on printability

General information

Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Department of Energy and Process Engineering
Contributors: Lahti, J., Tuominen, M.
Pages: 7-7
Publication date: 2010
Peer-reviewed: No

Publication information
Journal: Packaging Professional (The Magazine of the Packaging Society)
Volume: 33
Issue number: 5
ISSN (Print): 1477-8467
Original language: English

Bibliographical note
Contribution: organisation=epr pap,FACT1=1
Source: researchoutputwizard
Source ID: 8551
Research output: Contribution to journal › Article › Scientific

Turning up the heat on printability

General information
Publication status: Published
MoE publication type: B1 Article in a scientific magazine
Organisations: Department of Energy and Process Engineering
Contributors: Lahti, J., Tuominen, M.
Pages: 15-15
Publication date: 2010
Peer-reviewed: No

Publication information
Journal: Materials World
Volume: 18
Issue number: 10
ISSN (Print): 0967-8638
Ratings:

Scopus rating (2010): SJR 0.103 SNIP 0
Original language: English

Bibliographical note
Contribution: organisation=epr pap,FACT1=1
Source: researchoutputwizard
Source ID: 8552
Research output: Contribution to journal › Article › Scientific

Tutkimuksen teoreettinen viitekehys

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering
Contributors: Valkama, P., Kallio, O., Heino, O.
Number of pages: 17
Pages: 16-32
Publication date: 2013

Host publication information
Title of host publication: Markkinainnovaatiot yhdyskuntajätehuollossa : tutkimus jätehuoltopalvelujen markkinoiden evoluutiosta, sovelluksista ja jännitteistä kunnallisen ja yksityisen sektorin rajapinnassa
Place of publication: Tampere
Publisher: Tampereen yliopisto, Johtamiskorkeakoulu
Editor: Valkama, P.
ISBN (Print): 978-951-44-9163-4

ISBN (Electronic): 978-951-44-9164-1
URLs:
http://www.uta.fi/jkk/yhteystiedot/hallintotiede/valkama/projects/subprojects/VALKAMA3kirjapainojune2013.pdf

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-07-29
Source: researchoutputwizard
Source ID: 3636
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Tutkimusohjelma Elinkaaritehokas RAta (TERA): Kokonaisvaltainen ote ratarakennetutkimukseen

General information
Publication status: Published
Organisations: Civil Engineering, Research group: Track Structures
Contributors: Luomala, H.
Publication date: 15 Nov 2016

Publication information
Media of output: Rakennustekniikan vuosiseminaari 2016
Year: 2016
Original language: Finnish
Research output: Other contribution › Scientific

Tutkimustoiminnalla turvallisuutta ja toimintavarmuutta: päätös panostaa omaan jätevesilaboratorioon

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, University of Tampere
Contributors: Juuti, P., Rajala, R.
Pages: 77-84
Publication date: 2008

Host publication information
Title of host publication: Ei jätevedenpuhdistamoa minun takapihalleni : Jätevedenpuhdistuksen päätöksenteko, päätäntäprosessit ja julkinen keskustelu Espoossa historiassa, nyt ja tuelvaisuudessa
Publisher: TamPub
Editors: Juuti, P., Rajala, R.
ISBN (Print): 978-951-857-540-8
ISBN (Electronic): 978-951-44-7511-5
URLs:
http://urn.fi/urn:isbn:978-951-44-7511-5
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Two Years after Donor Funding Ended: Success Factors for Schools to Keep their Urine-Diverting Dry Toilets (UDDTs) Clean and Well Maintained

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Chemistry and Bioengineering
Contributors: Pynnönen, K., Tuhkanen, T., Rieck, C., von Munch, E.
Number of pages: 10
Pages: 1-10
Publication date: 2012

Host publication information
Title of host publication: Dry Toilet Conference 2012, 4th International Dry Toilet Conference, Full Papers, 22-24 August 2012, Tampere, Finland
Place of publication: Helsinki
Publisher: Global Dry Toilet Assciation of Finland

Publication series

Name: International Dry Toilet Conference
URLs:
http://www.drytoilet.org/dt2012/full_papers/6/Kirsikka_Pynnonen-Tuhkanen-Rieck-Munch.pdf

Bibliographical note
ei ut-numeroa 28.8.2013
Contribution: organisation=keb bio,FACT1=1
Publisher name: Global Dry Toilet Assciation of Finland
Source: researchoutputwizard
Source ID: 5122
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Työntekijöiden altistuminen sähkö- ja magneettikentille 110 kV sähköasemien työtehtävissä

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Department of Energy and Process Engineering
Contributors: Korpinen, L.
Number of pages: 62
Publication date: 2011

Publication information
Publisher: Tampereen teknillinen yliopisto
ISBN (Print): 978-952-15-2532-2
Original language: Finnish

Publication series
Name: Tampereen teknillinen yliopisto. Energia- ja prosessitekniikan laitos. Raportti
Publisher: Tampereen teknillinen yliopisto
Volume: 192
ISSN (Print): 1459-3440

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 6415
Research output: Book/Report › Commissioned report › Professional

Ulkoistaminen apuväline vesihuoltoverkostojen kunnossapitoon?

General information
Publication status: Published
MoE publication type: D1 Article in a trade journal
Organisations: Department of Chemistry and Bioengineering
Contributors: Heino, O.
Pages: 10-12
Publication date: 2012
Peer-reviewed: Unknown

Publication information
Journal: Promaint
Volume: 26
Issue number: 5
ISSN (Print): 1797-2000
Original language: Finnish

Bibliographical note
Contribution: organisation=keb,FACT1=1
Portfolio EDEND: 2013-07-29
Publisher name: KP-Media Oy
Source: researchoutputwizard
Source ID: 4196
Research output: Contribution to journal › Article › Professional

Understanding sustainable development in Finnish water supply and sanitation services

Water supply and sanitation services are essential to human and environmental well-being. Globally one of the biggest challenges to sustainable development is lack of access to improved water supply and sanitation services. Yet it is less

obvious what sustainable development means in countries with high coverage of these services. In this article sustainable development is explored from the perspective of Finnish water supply and sanitation services. The study consists of eight semi-structured interviews with water sector experts and their views are analysed in relation to literature. In this article sustainable development is understood as a learning process and dialogue of values. The interviewed water sector experts primarily perceive sustainable development from an environmental point of view, and treat it in a rationalistic and mechanistic manner. Challenges are tackled by technological fixes, such as improving energy and material efficiency. It is argued in this paper that this kind of approach undermines the complexity and dynamicity of sustainable development and can suppress learning. Sustainable development is mostly explored only from the perspective of water services, although some of the interviewees recognise their role for wider societal development. Interaction and dialogue between water sector experts and the community regarding sustainable development is lacking or skills to accomplish this interaction are inadequate.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Civil Engineering
Contributors: Takala, A.
Pages: 501-512
Publication date: Dec 2017
Peer-reviewed: Yes
Early online date: 16 Dec 2017

Publication information
Journal: International Journal of Sustainable Built Environment
Volume: 6
Issue number: 2
ISSN (Print): 2212-6090
Ratings:
Scopus rating (2017): CiteScore 3.2 SJR 0.746 SNIP 2.184
Original language: English
Keywords: Sustainable development, Water supply services, Sanitation services, Finland
Electronic versions:
1-s2.0-S2212609017300675-main
DOIs:
10.1016/j.ijsbe.2017.10.002
URLs:
http://urn.fi/URN:NBN:fi:tty-201801311183
Source: RIS
Source ID: urn:C2FE0242F9120141394460CED76A001D
Research output: Contribution to journal › Article › Scientific › peer-review

Unipoli Green - Four Universities Working Together for Sustainability

This paper introduces the Finnish context for promoting sustainable development in higher education and describes and analyzes the development of cooperation in Tampere, Finland: its benefits, challenges and limitations. The expectations for universities to promote sustainable development are rising while the resources for sustainability work are scarce. In Tampere there are four universities, Police University College, Tampere University of Applied Science, Tampere University of Technology and University of Tampere, educating and employing over 40,000 people. Promoting sustainability is in different phases at each of these universities. The coordinators of sustainable development in these universities met in spring 2014 and agreed on information sharing and cooperation in the form of concrete events and thematic days. This initiative was supported by the existence of the universities' cooperation platform UNIPOLI. Later the cooperation has found three major fields: (1) awareness raising, (2) sharing information and influencing management and (3) curriculum development. Possibility of sharing knowledge and experiences and building a community has enabled more efficient actions in all these fields, but the vague mandate of network has caused confusion and hindered realization of some ideas.

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Facilities and Infrastructure
Contributors: Asikainen, E., Hellman, S., Parjanen, L., Puputti, M., Raatikainen, S., Schroderus, M.
Number of pages: 17
Pages: 257-273
Publication date: 2 Dec 2016

Host publication information

Title of host publication: Handbook of Theory and Practice of Sustainable Development in Higher Education: Volume 3
Publisher: Springer International Publishing
Editors: Leal Filho, W., Mifsud, M., Shiel, C., Pretorius, R.
ISBN (Print): 978-3-319-47894-4
ISBN (Electronic): 978-3-319-47895-1

Publication series
Name: World Sustainability Series
ISSN (Electronic): 2199-7373
DOIs:
10.1007/978-3-319-47895-1_16
Source: RIS
Source ID: Asikainen2017
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Unsteady computational methods to study jet behaviour in large fluidized bed boiler

General information
Publication status: Published
MoE publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Energy and Process Engineering
Contributors: Tiitinen, K., Ylitalo, M., Oksanen, A.
Number of pages: 22
Pages: 1-22
Publication date: 2010

Host publication information
Title of host publication: AFRC 2010 Pacific Rim Combustion Symposium, September 26-29, 2010 Sheraton Maui, Hawaii

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 9404
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific

Urban water conflicts in recent European history: Changing interactions between technology, environment and society

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, Former organisation of the author
Contributors: Barraque, B., Juuti, P. S., Katko, T. S.
Pages: 15-32
Publication date: 2012

Host publication information
Title of host publication: Urban water conflicts
Publisher: Taylor & Francis and UNESCO Publishing; A Balkema book
Editor: Barraque, B.
ISBN (Print): 978-0-415-49862-3
ISBN (Electronic): 978-1-46-654690-5

Publication series
Name: Urban water series, UNESCO IHP
Publisher: Taylor & Francis and UNESCO Publishing; A Balkema book
Volume: 7
ISSN (Print): 1749-0790
URLs:
http://www.crcpress.com/product/isbn/9780415498630

Bibliographical note
ei ut-numeroa 9.8.2013
Contribution: organisation=keb bio,FACT1=1
Source: researchoutputwizard
Source ID: 3892
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Use of analytical expressions of convection in conjugated heat transfer problems

General information
Publication status: Published
MoE publication type: A4 Article in a conference publication
Organisations: Department of Energy and Process Engineering
Contributors: Karvinen, R.
Number of pages: 13
Pages: 1-13
Publication date: 2010

Host publication information
Title of host publication: Proceedings of the International Heat Transfer IHTC-14, August 8-13, 2010, Washington DC, USA
Publisher: ASME
URLs:

http://asmeconferences.org/IHTC14

Bibliographical note
Contribution: organisation=epr,FACT1=1
Source: researchoutputwizard
Source ID: 8301
Research output: Chapter in Book/Report/Conference proceeding › Conference contribution › Scientific › peer-review

Use of diluted urine for cultivation of Chlorella vulgaris
Our aim was to study the biomass growth of microalga Chlorella vulgaris using diluted human urine as a sole nutrient source. Batch cultivations (21 days) were conducted in five different urine dilutions (1:25-1:300), in 1:100-diluted urine as such and with added trace elements, and as a reference, in artificial growth medium. The highest biomass density was obtained in 1:100-diluted urine with and without additional trace elements (0.73 and 0.60 g L(-1), respectively). Similar biomass growth trends and densities were obtained with 1:25- and 1:300-diluted urine (0.52 vs. 0.48 gVSS L(-1)) indicating that urine at dilution 1:25 can be used to cultivate microalgal based biomass. Interestingly, even 1:300-diluted urine contained sufficiently nutrients and trace elements to support biomass growth. Biomass production was similar despite pH-variation from < 5 to 9 in different incubations indicating robustness of the biomass growth. Ammonium formation did not inhibit overall biomass growth. At the beginning of cultivation, the majority of the biomass consisted of living algal cells, while towards the end, their share decreased and the estimated share of bacteria and cell debris increased.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Contributors: Jaatinen, S., Lakaniemi, A., Rintala, J.
Number of pages: 12
Pages: 1159-1170
Publication date: 2016
Peer-reviewed: Yes
Early online date: 7 Nov 2015

Publication information
Journal: Environmental Technology
Volume: 37
Issue number: 9
ISSN (Print): 0959-3330
Ratings:

Scopus rating (2016): CiteScore 3.1 SJR 0.569 SNIP 0.836
Original language: English
DOIs:

10.1080/09593330.2015.1105300
Source: PubMed
Source ID: 26508358
Research output: Contribution to journal › Article › Scientific › peer-review

Use of factorial experimental design to study the effects of iron and sulfur on growth of Scenedesmus acuminatus with different nitrogen sources

The aim of this study was to determine the combined effects of iron and sulfur on microalgal biomass concentration and removal efficiency of nitrogenous compounds using factorial design. Scenedesmus acuminatus (currently accepted name Tetradesmus lagerheimii) was separately cultivated in batch photobioreactors using modified N-8 media with two nitrogen sources, nitrate, and ammonium. To study the interaction effect between iron and sulfur and to reduce the total number of experimentally studied combinations, a factorial design was used. Three iron (0.1, 1, and 1.9 mg L^{-1}) and three sulfur concentrations (3.7, 20, and 35.8 mg L^{-1}) were employed to the modified N-8 media in this study. The results show that the final microalgal biomass concentration and nitrogen removal efficiency were more sensitive to the changes in iron and sulfur concentrations in the media with nitrate than with ammonium possibly because of the different assimilation mechanisms used by microalgae for these two nitrogen sources. The created models demonstrated that iron had a statistically significant effect on the microalgal biomass concentration and nitrate removal efficiency while sulfur did not. In addition, the interaction effect between iron and sulfur was not significant on microalgal biomass concentration and nitrogen removal. In synthetic medium with nitrate as nitrogen source, the highest microalgal biomass concentration was obtained with 1.0 mg L^{-1} iron and 35.8 mg L^{-1} sulfur.

General information

Publication status: E-pub ahead of print
MoE publication type: A1 Journal article-refereed
Organisations: Materials Science and Environmental Engineering, Research group: Bio- and Circular Economy, University of South Florida Tampa, Université de Paris-Sud, UNESCO-IHE Institute for Water Education, Delft, Hydraulic and Environmental Engineering (IHE) Inst. for Water Education
Contributors: Tao, R., Bair, R., Lakaniemi, A. M., van Hullebusch, E. D., Rintala, J. A.
Publication date: 2019
Peer-reviewed: Yes

Publication information

Journal: Journal of Applied Phycology
ISSN (Print): 0921-8971
Ratings:

Scopus rating (2019): CiteScore 5.1 SJR 0.89 SNIP 1.198
Original language: English
ASJC Scopus subject areas: Aquatic Science, Plant Science
Keywords: Chlorophyceae, Factorial experimental design, Iron, Microalgal growth, Nitrogen removal, Sulfur
Electronic versions:

Tao2019_Article_UseOfFactorialExperimentalDesi
DOIs:

10.1007/s10811-019-01915-5
URLs:

http://urn.fi/URN:NBN:fi:tuni-201912026476
Source: Scopus
Source ID: 85074596640
Research output: Contribution to journal › Article › Scientific › peer-review

Utilising alternative fuels and technologies in city buses

General information

Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Civil Engineering, Research group: Transport Research Centre Verne, Suomen ympäristökeskus SYKE - Finnish Environment Institute
Contributors: Judl, J., Mäkinen, J.
Number of pages: 4
Publication date: 28 Nov 2019

Publication information

Publisher: Suomen ympäristökeskus (SYKE)
ISBN (Electronic): 978-952-11-5142-2
Original language: English
URLs:

https://issuu.com/suomenymparistokeskus/docs/canemure-bestpractices_buses_28-11-2019?fr=sYWY5ZDEyNDU1ODA
Research output: Book/Report › Commissioned report › Professional

Utility–Customer Communication: The Case of Water Utilities

The aim of this article is to shed light on the theory and praxis of utility stakeholder communication. Our general research objective is to contrast citizens' experiences of utility-specific information needs with the views of communication managers of municipal water utilities. Empirical data for the study were gathered using two methods. Citizens' views were gathered from street interviews in several Finnish middle-sized cities, whereas the views of communication professionals of municipal water utilities were collected via email-based survey. Empirical analysis shows that one-way communication has its relevance, and it should actually be improved most notably in exceptional situations, such as water supply disruptions. More profound changes in customer communication require, however, that utilities support customers' strive for sustainable and economical water consumption. The overall challenge to utilities is to get closer to the everyday needs of their customers and to develop new communication culture to support such an endeavor.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, University of Tampere
Contributors: Heino, O., Anttiroiko, A.
Pages: 220-230
Publication date: 2015
Peer-reviewed: Yes
Early online date: 22 Sep 2015

Publication information

Journal: Public Works Management and Policy
Volume: 21
Issue number: 3
ISSN (Print): 1087-724X
Ratings:

Scopus rating (2015): CiteScore 0.9 SJR 0.242 SNIP 0.41
Original language: English
DOIs:

10.1177/1087724X15606738
Research output: Contribution to journal › Article › Scientific › peer-review

Utilizing Gelatinized Starchy Waste from Rice Noodle Factory as Substrate for L(+)-Lactic Acid Production by Amylolytic Lactic Acid Bacterium Enterococcus faecium K-1

To valorize starchy waste from rice noodle factory, bioconversion of gelatinized starchy waste (GSW) to value-added product as L(+)-lactic acid, the monomer for polylactate synthesis, was investigated using amylolytic lactic acid bacterium, Enterococcus faecium K-1. Screening for appropriate nitrogen source to replace expensive organic nitrogen sources revealed that corn steep liquor (CSL) was the most suitable regarding high efficacy for L(+)-LA achievement and low-cost property. The successful applying statistic experimental design, Plackett-Burman design incorporated with central composite design (CCD), predicted the maximum L(+)-LA of 93.07 g/L from the optimized medium (OM) containing 125.7 g/L GSW and 207.3 g/L CSL supplemented with CH_3COONa, $MgSO_4$, $MnSO_4$, K_2HPO_4, $CaCl_2$, $(NH_4)_2HC_6H_5O_7$, and Tween80. Minimizing the medium cost by removal of all inorganic salts and Tween80 from OM was not an effect on L(+)-LA yield. Fermentation using the optimized medium without minerals (OM-Mi) containing only GSW (125.7 g/L) and CSL (207.3 g/L) in a 10-L fermenter was also successful. Thinning GSW with α-amylase from Lactobacillus plantarum S21 increased L(+)-LA productivity in the early stage of 24-h fermentation. Not only showing the feasible bioconversion process for GSW utilizing as a substrate for L(+)-LA production, this research also demonstrated the efficient model for industrial starchy waste valorization.

General information

Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Materials Science and Environmental Engineering, Chiang Mai University, North Dakota State University
Contributors: Unban, K., Khanongnuch, R., Kanpiengjai, A., Shetty, K., Khanongnuch, C.
Publication date: May 2020
Peer-reviewed: Yes

Publication information

Journal: Applied Biochemistry and Biotechnology
ISSN (Print): 0273-2289
Original language: English
ASJC Scopus subject areas: Biotechnology, Bioengineering, Biochemistry, Applied Microbiology and Biotechnology, Molecular Biology

Keywords: ALAB, Enterococcus faecium, L-lactic acid, Low-cost medium, Starchy waste
DOIs:

10.1007/s12010-020-03314-w
Source: Scopus
Source ID: 85084316077
Research output: Contribution to journal › Article › Scientific › peer-review

Uuden vuosituhannen tiennäyttäjä – HS-Veden alkutaival

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Civil Engineering, University of Tampere
Contributors: Juuti, P., Rajala, R.
Pages: 177-222
Publication date: 2011

Host publication information
Title of host publication: Vinttikaivosta vesiyhtiöön
Place of publication: Saarijärvi
Publisher: TamPub
Editors: Juuti, P., Rajala, R.
ISBN (Print): 978-952-92-8428-3
ISBN (Electronic): 978-951-44-8409-4
URLs:

http://urn.fi/urn:isbn:978-951-44-8409-4
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

UV-Blocking Synthetic Biopolymer from Biomass-Based Bifuran Diester and Ethylene Glycol
A furan-based synthetic biopolymer composed of a bifuran monomer and ethylene glycol was synthesized through melt polycondensation, and the resulting polyester was found to have promising thermal and mechanical properties. The bifuran monomer, dimethyl 2,2′-bifuran-5,5′-dicarboxylate, was prepared using a palladium-catalyzed, phosphine ligand-free direct coupling protocol. A titanium-catalyzed polycondensation procedure was found effective at polymerizing the bifuran monomer with ethylene glycol. The prepared bifuran polyester exhibited several intriguing properties including high tensile modulus. In addition, the bifuran monomer furnished the polyester with a relatively high glass transition temperature. Films prepared from the new polyester also had excellent oxygen and water barrier properties, which were found to be superior to those of poly(ethylene terephthalate). Moreover, the novel polyester also has good ultraviolet radiation blocking properties.

General information
Publication status: Published
MoE publication type: A1 Journal article-refereed
Organisations: Chemistry and Bioengineering, Research group: Chemistry & Advanced Materials, University of Oulu, Research Unit of Sustainable Chemistry, P.O. Box 3000, FI-90014 Oulu, University of Oulu, Fibre and Particle Engineering Research Unit, P.O. Box 4300, FI-90014 Oulu
Contributors: Kainulainen, T. P., Sirviö, J. A., Sethi, J., Hukka, T. I., Heiskanen, J. P.
Number of pages: 8
Pages: 1822-1829
Publication date: 21 Feb 2018
Peer-reviewed: Yes
Early online date: 21 Feb 2018

Publication information
Journal: Macromolecules
Volume: 51
Issue number: 5
ISSN (Print): 0024-9297
Ratings:

Scopus rating (2018): CiteScore 9.9 SJR 2.243 SNIP 1.492
Original language: English
ASJC Scopus subject areas: Chemistry(all), Materials Science(all)
Keywords: Biopolymers, Synthesis, Characterization, Thermal analysis, Spectroscopy
Electronic versions:

UV-blocking synthetic biopolymer 2018

DOIs:
10.1021/acs.macromol.7b02457
URLs:
http://urn.fi/URN:NBN:fi:tuni-202002132050
Research output: Contribution to journal › Article › Scientific › peer-review

UV irradiation for Micropollutant removal from aqueous solution in the presence of H2O2

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering
Contributors: Tuhkanen, T. A., Cajal Marinosa, P.
Pages: 295-320
Publication date: 2010

Host publication information
Title of host publication: Treatment of Micropollutants in Water and Wastewater. Integrated Environmental Technology Series
Editors: Virkutyte, J., Varma, R., Jegatheesan, V.
ISBN (Print): 1843393166

Bibliographical note
Contribution: organisation=keb kem,FACT1=1
Source: researchoutputwizard
Source ID: 9423
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Vaatimus paremmasta puhdistustuloksesta ohjaa jätevedenpuhdistuksen päätöksentekoa

General information
Publication status: Published
MoE publication type: A3 Part of a book or another research book
Organisations: Department of Chemistry and Bioengineering, University of Tampere
Contributors: Juuti, P., Rajala, R.
Pages: 65-72
Publication date: 2008

Host publication information
Title of host publication: Ei jätevedenpuhdistamoa minun takapihalleni : Jätevedenpuhdistuksen päätöksenteko, päätäntäprosessit ja julkinen keskustelu Espoossa historiassa, nyt ja tuelvaisuudessa
Publisher: TamPub
Editors: Juuti, P., Rajala, R.
ISBN (Print): 978-951-857-540-8
ISBN (Electronic): 978-951-44-7511-5
URLs:
http://urn.fi/urn:isbn:978-951-44-7511-5
Research output: Chapter in Book/Report/Conference proceeding › Chapter › Scientific › peer-review

Vaihtoehtoisten käyttövoimien hyödyntäminen kaupunkiliikenteen linja-autoissa

General information
Publication status: Published
MoE publication type: D4 Published development or research report or study
Organisations: Civil Engineering, Research group: Transport Research Centre Verne, Suomen ympäristökeskus SYKE - Finnish Environment Institute
Contributors: Judl, J., Mäkinen, J.
Number of pages: 4
Publication date: 28 Nov 2019

Publication information
Publisher: Suomen ympäristökeskus (SYKE)
ISBN (Electronic): 978-952-11-5116-3
Original language: Finnish

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Organisations: Civil Engineering
Contributors: Juuti, P., Rajala, R.
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Valorization of Finnish mining tailings for use in the ceramics industry
The present study valorized Finnish mining tailings waste to identify opportunities for the use of ceramics technologies. On the basis of their mineralogical and chemical contents, the five selected tailings wastes represented felsic mining tailings (FMT) rich in quartz and alkali feldspars, mining tailings dominated by Mg- and Fe-bearing minerals (MgFeMT), and mining tailings rich in carbonate minerals (CMT). Preliminary pilot studies indicated that the FMT materials are potential secondary raw materials for mullite-type ceramics. An Al additive was needed, since the Al2O3 content of the studied tailings was too low for mullitization. In addition, carbonate-bearing tailings with Ca silicates can be applicable for chemically bonded phosphate ceramic (CBPC) synthesis. Based on a literature review, FMT are viable source materials for the production of geopolymers, but a high initial Si:Al ratio (in quartz-rich FMT) may lead to partial geopolymerization. Preliminary results from the geopolymerization of pre-heated phlogopite mica mixed with metakaolin gave promising findings, with the formation of a geopolymer having good compressive strength. The findings support the viability of MgFeMT materials rich in phlogopite mica for the production of alkali-activated ceramics.

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MoE publication type: A1 Journal article-refereed
Organisations: Materials Science, Research group: Ceramic materials, Geological Survey of Finland, VTT, Geologian tutkimuskeskus, University of Oulu
Contributors: Solismaa, S., Ismailov, A., Karhu, M., Sreenivasan, H., Lehtonen, M., Kinnunen, P., Illikainen, M., Räisänen, M.
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Values and Attitudes in Engineering Education

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Organisations: Department of Chemistry and Bioengineering
Contributors: Korhonen-Yrjänheikki, K., Takala, A., Mielityinen, I.
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Vanhuus uhkaa vesihuoltoa

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MoE publication type: E1 Popularised article, newspaper article
Organisations: Department of Chemistry and Bioengineering
Contributors: Katko, T.
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Vapor phase processing of α-Fe2O3 photoelectrodes for water splitting: An insight into the structure/property interplay
Harvesting radiant energy to trigger water photoelectrolysis and produce clean hydrogen is receiving increasing attention in the search of alternative energy resources. In this regard, hematite (alpha-Fe2O3) nanostructures with controlled nano-organization have been fabricated and investigated for use as anodes in photoelectrochemical (PEC) cells. The target systems have been grown on conductive substrates by plasma enhanced-chemical vapor deposition (PE-CVD) and subjected to eventual ex situ annealing in air to further tailor their structure and properties. A detailed multitechnique approach has enabled to elucidate between system characteristics and the generated photocurrent. The present alpha-Fe2O3 systems are characterized by a high purity and hierarchical morphologies consisting of nanopyramids/organized dendrites, offering a high contact area with the electrolyte. PEC data reveal a dramatic response enhancement upon thermal treatment, related to a more efficient electron transfer. The reasons underlying such a phenomenon are elucidated and discussed by transient absorption spectroscopy (TAS) studies of photogenerated charge carrier kinetics, investigated on different time scales for the first time on PE-CVD Fe2O3 nanostructures.

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Organisations: Department of Chemistry and Bioengineering, Research group: Supramolecular photochemistry, Univ Brescia, University of Brescia, Chem Technol Lab, Department of Physics and Astronomy, University of Turku, Univ Antwerp, University of Antwerp, EMAT, Padova University and INSTM, CNR-IENI, Chemistry for Technologies Laboratory , Padova University
Contributors: Warwick, M. E. A., Kaunisto, K., Barreca, D., Carraro, G., Gasparotto, A., Maccato, C., Bontempi, E., Sada, C., Ruoko, T., Turner, S., Van Tendeloo, G.
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