



Electropolymerized polyazulene as active material in flexible supercapacitors

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ELECTROPOLYMERIZED POLYAZULENE AS ACTIVE MATERIAL IN FLEXIBLE SUPERCAPACITORS

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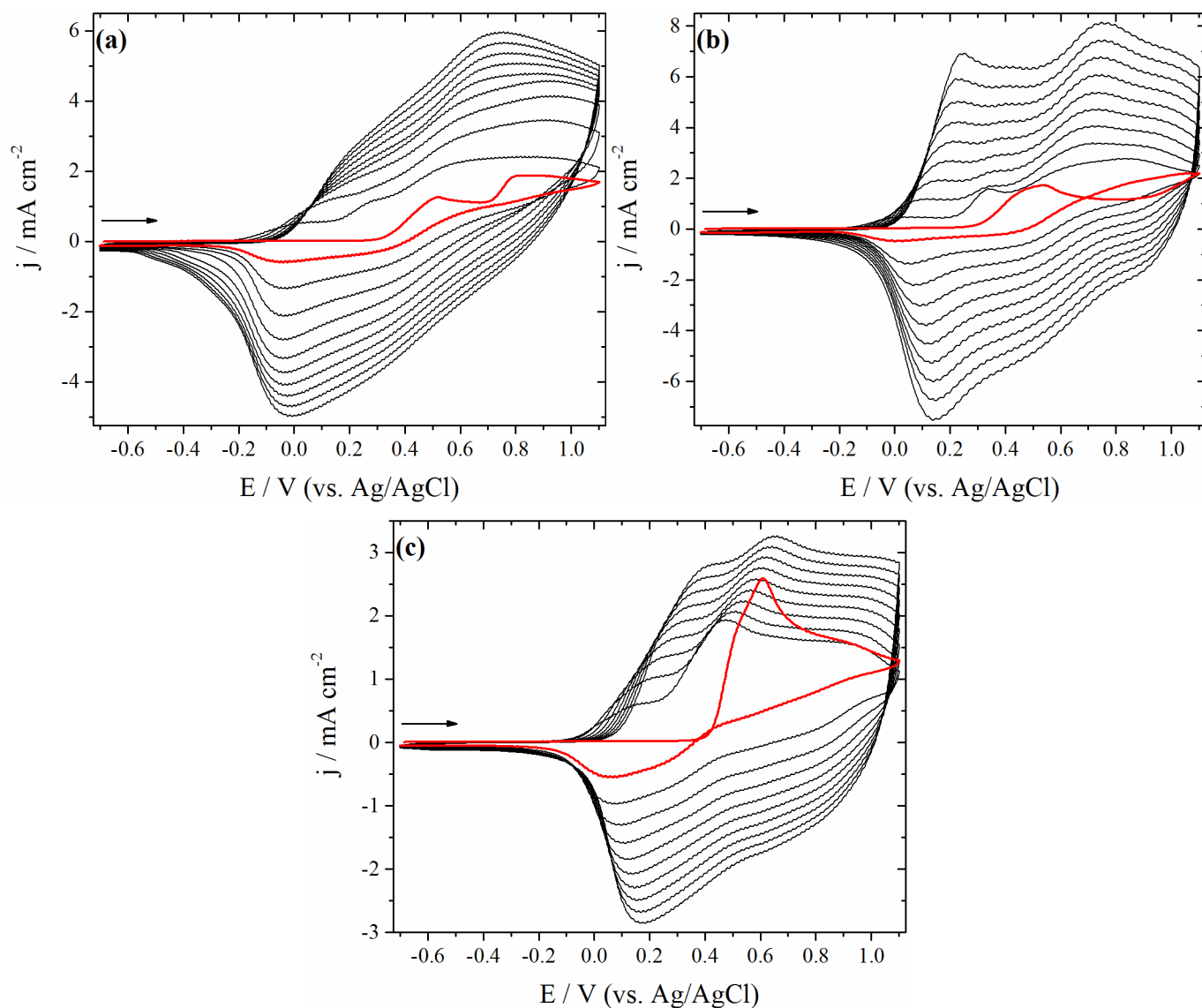


Fig. S1. Consecutive CVs of PAz electropolymerization in a) [Choline][TFSI], b) [Emim][TFSI], and c) [Hmim][BF₄]. Monomer concentration was 50 mM and 10 consecutive cycles were recorded in the potential range -0.7–1.1 V at 50 mV s⁻¹ scan rate. Polymerizations were conducted at 32 °C. Arrows show the cycling direction, and first cycle is presented in red.

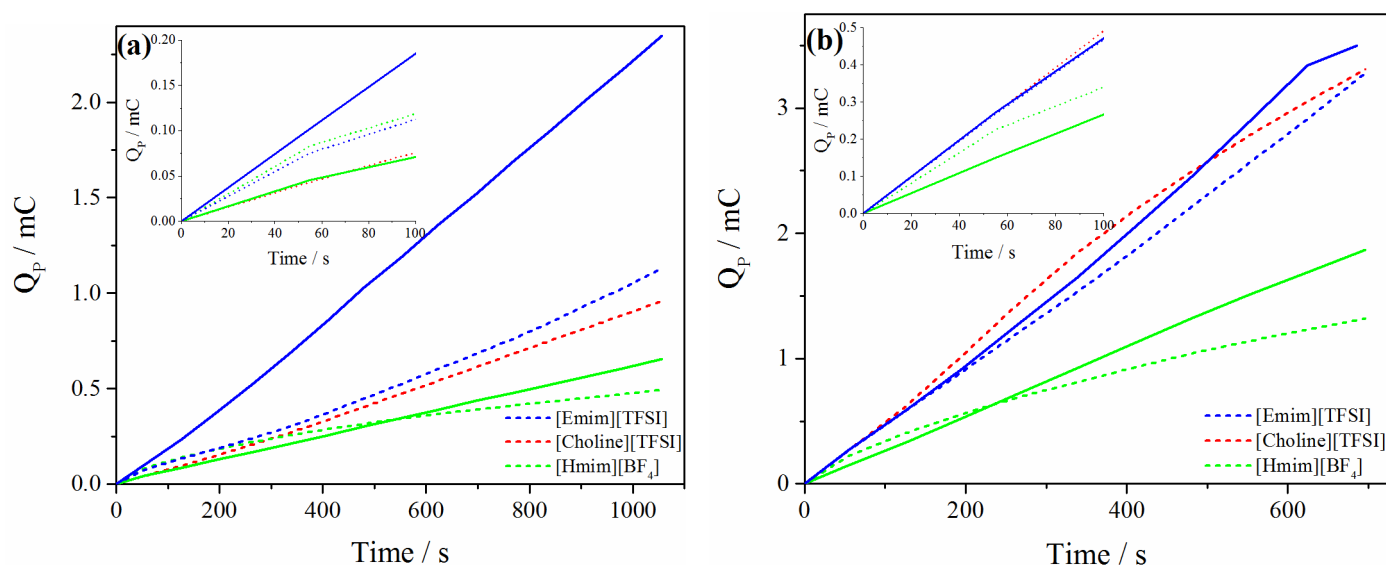


Fig. S2. The polymerization charge in different conditions. In a) 20 mM and in b) 50 mM monomer concentration was used. Polymerizations where heating (32 °C) was applied are depicted with dashed lines and solid lines represent polymerizations in room temperature. [Choline][TFSI] system was always heated since problems with solidification occurred near room temperature.

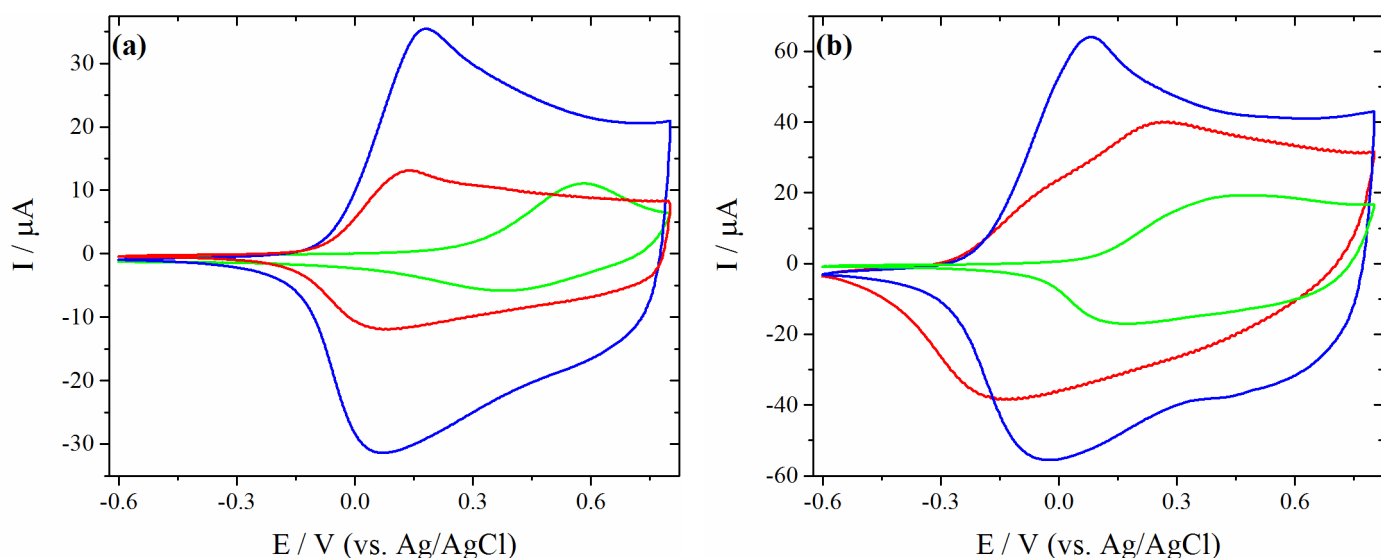


Fig. S3. CVs of PAz p-doping in [Choline][TFSI] (red), [Emim][TFSI] (blue), and [Hmim][BF₄] (green). Scan rate is 50 mV s⁻¹ and the potential window is -0.6–0.8 V. a) 20 mM monomer concentration and 15 consecutive cycles during polymerization were applied. b) 50 mM monomer concentration and 10 consecutive cycles in polymerization were applied.

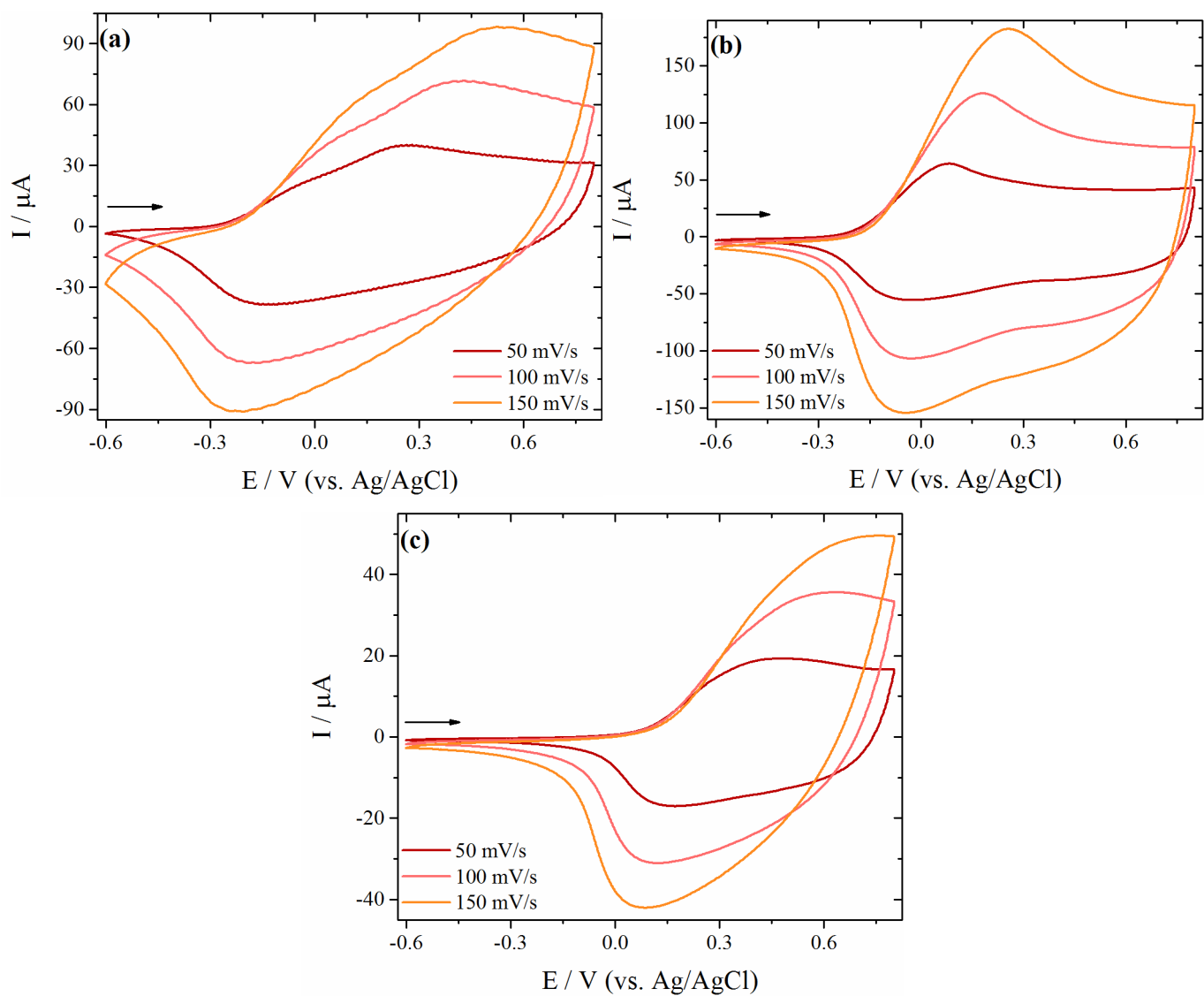


Fig. S4. CVs of PAz p-doping with different scan rates in a) [Choline][TFSI], b) [Emim][TFSI], and c) [Hmim][BF₄].

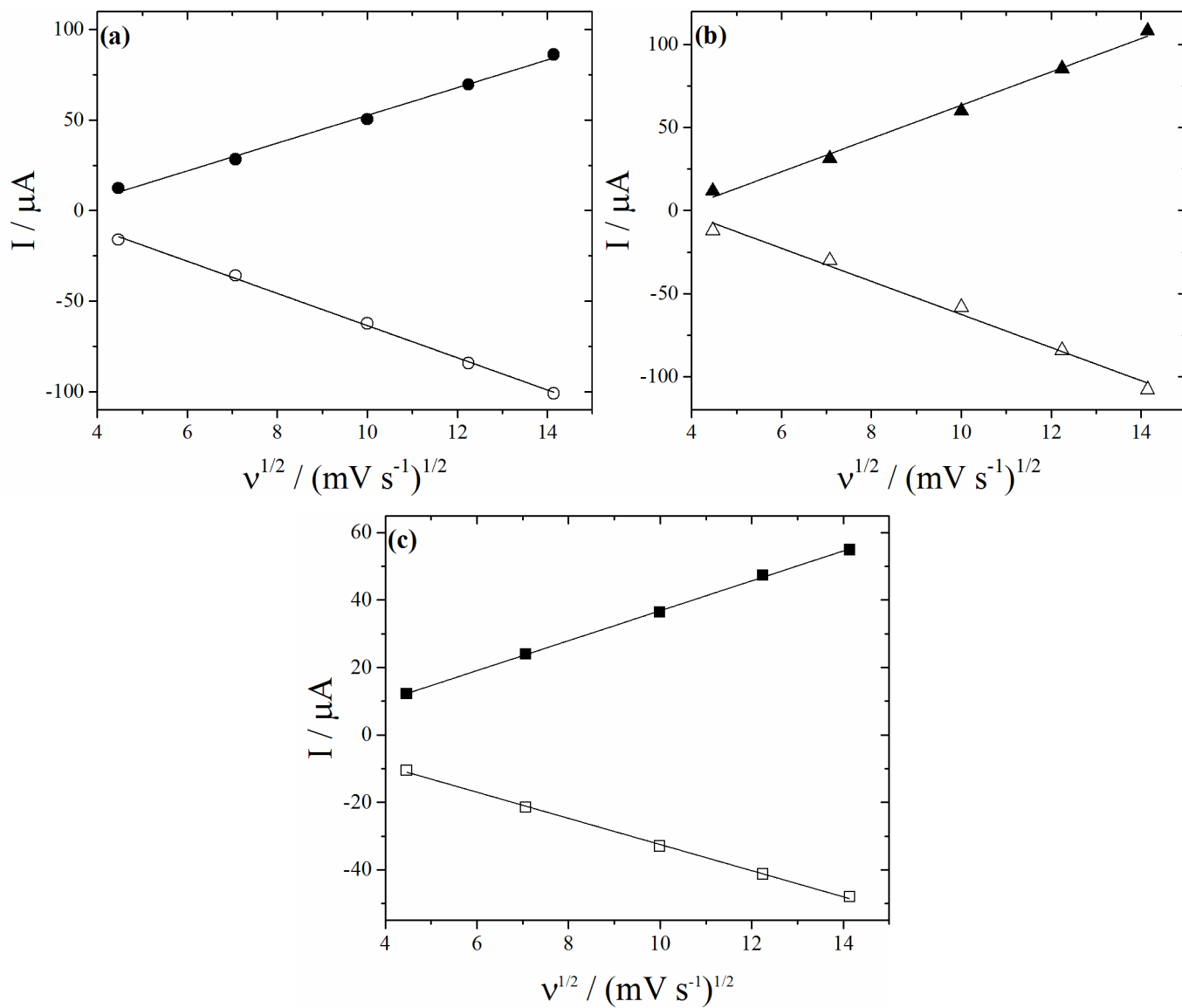


Fig. S5. Dependence of maximum peak current to square root of scan rate of PAz p-doping in a) [Choline][TFSI], b) [Emim][TFSI], and c) [Hmim][BF₄].

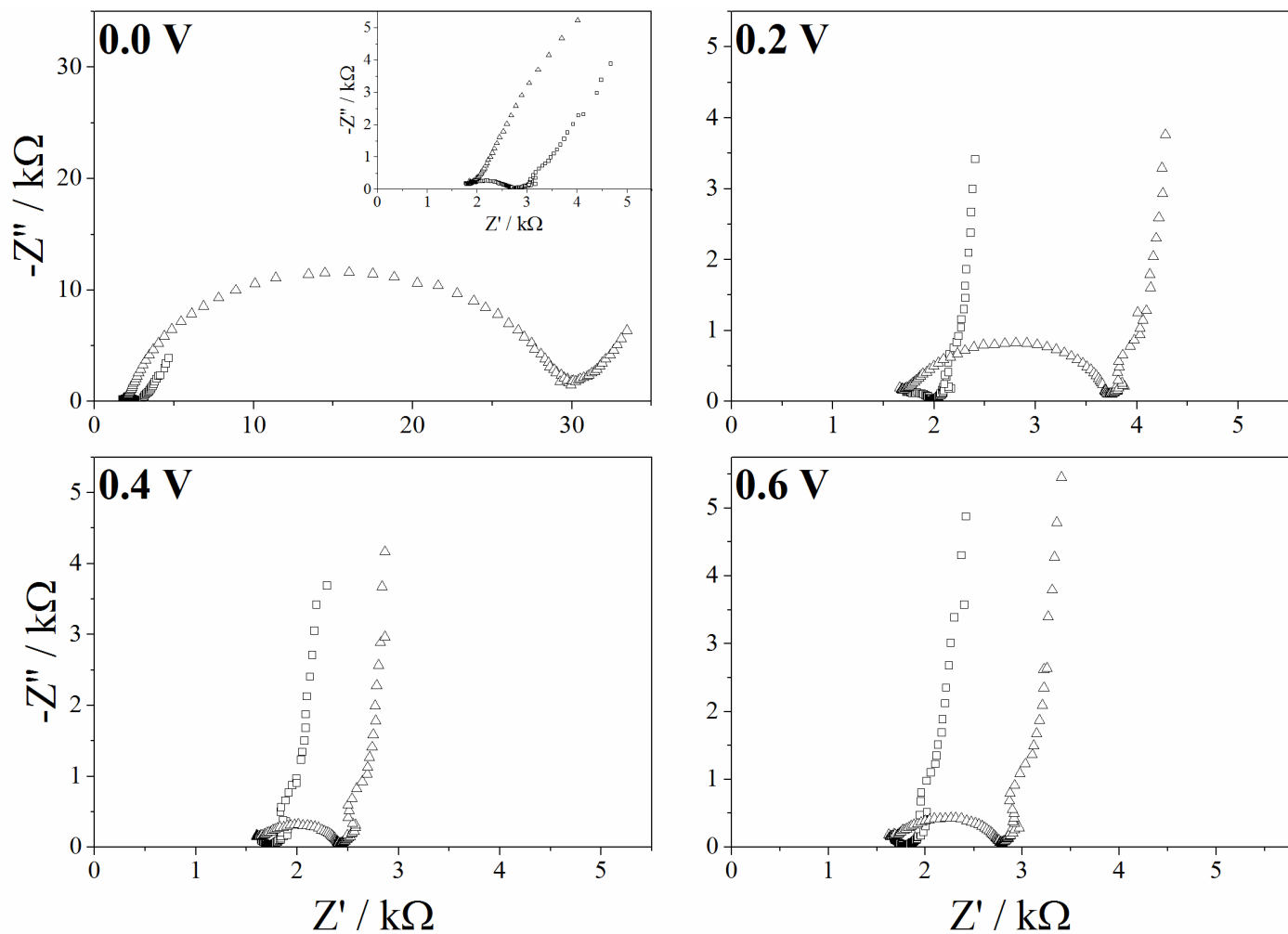


Fig. S6. Complex impedance plots of PAz film in [Choline][TFSI] at 0.0, 0.2, 0.4 and 0.6 V after polymerization (square) and long term cycling (triangle).

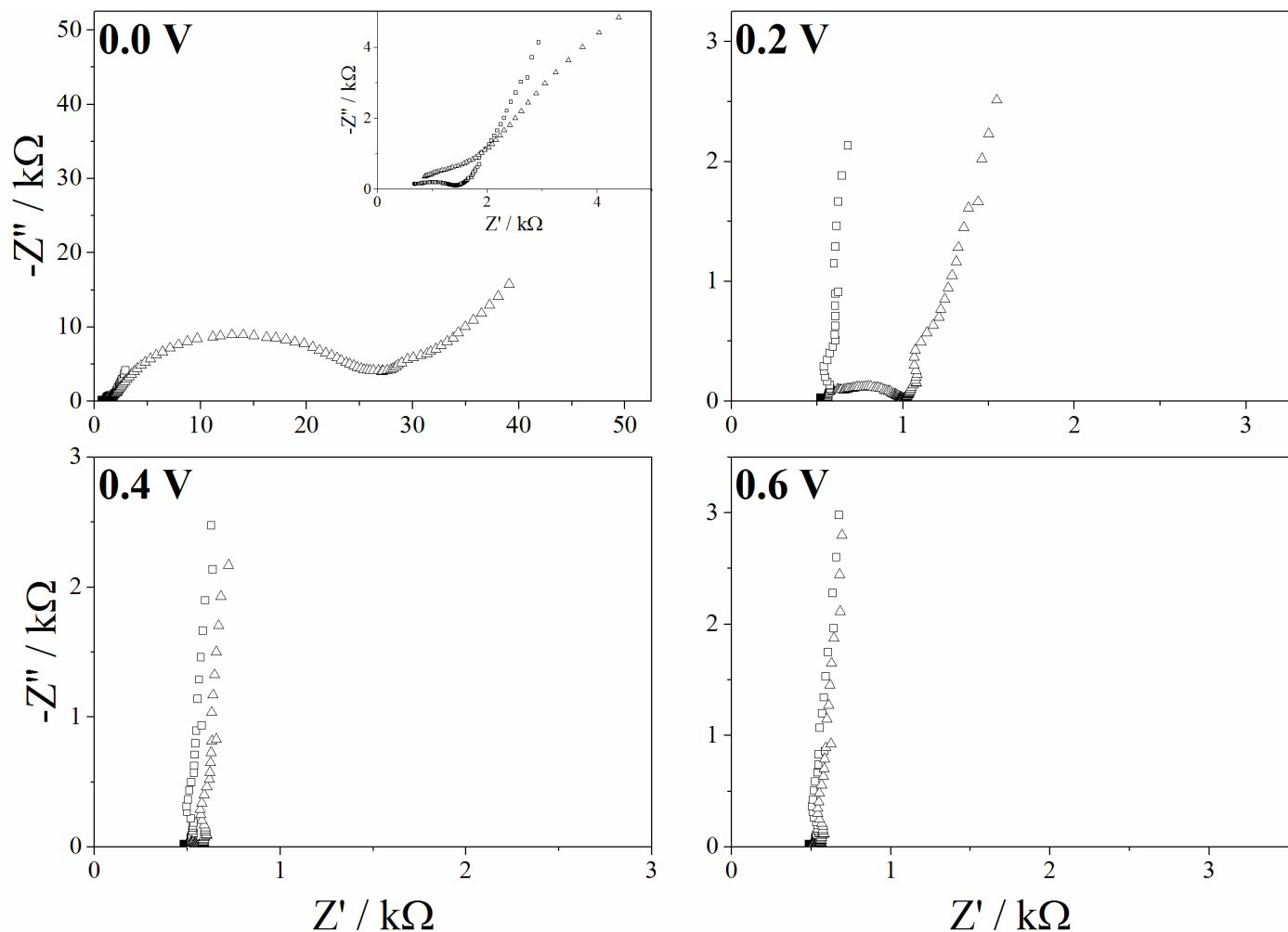


Fig. S7. Complex impedance plots of PAz film in [Emim][TFSI] at 0.0, 0.2, 0.4 and 0.6 V after polymerization (square) and long term cycling (triangle).

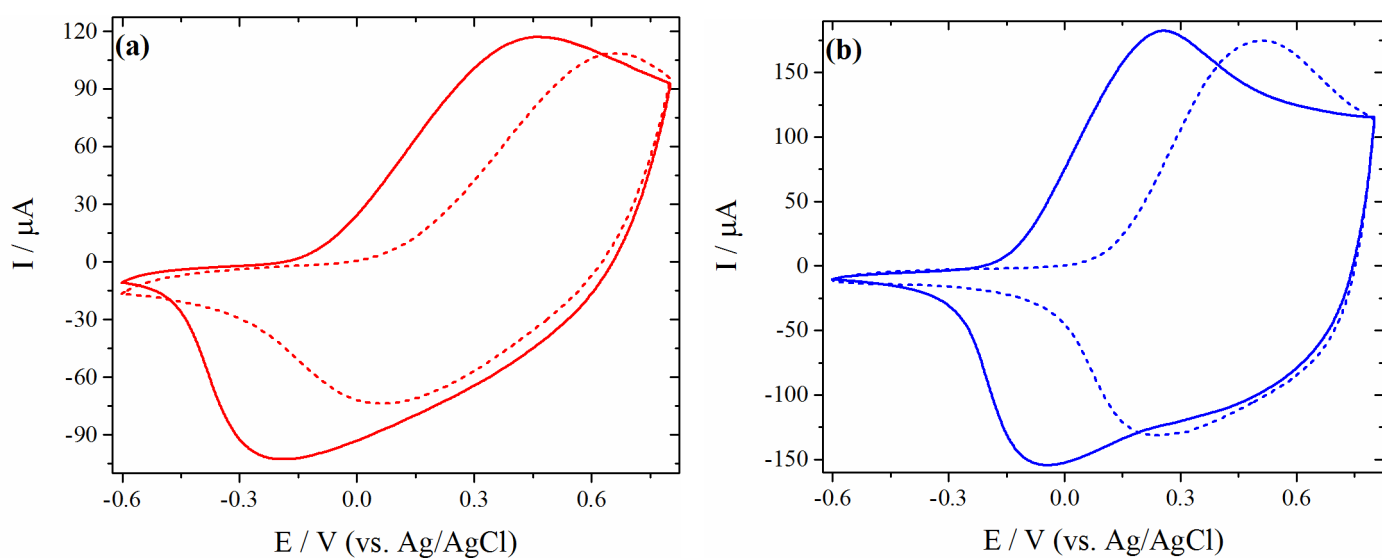


Fig. S8. CVs of PAz p-doping in the potential range -0.6–0.8 V with 150 mV s^{-1} scan rate in a) [Choline][TFSI] and b) [Emim][TFSI] after polymerization (solid line) and after long term cycling (dashed line).

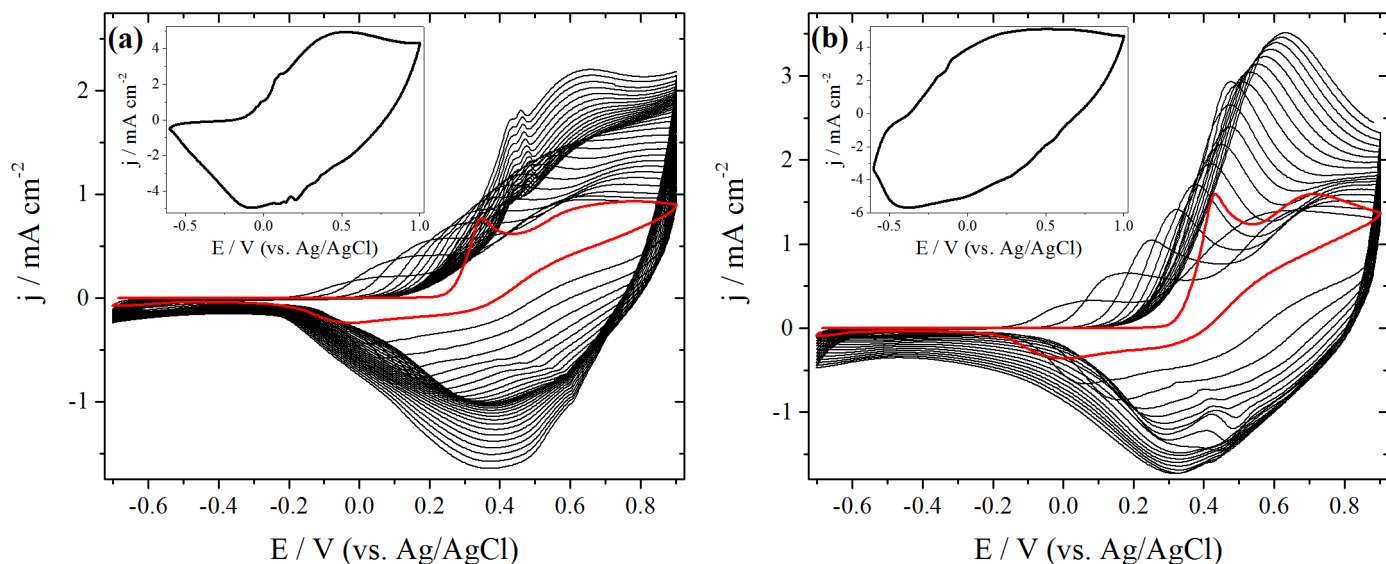


Fig. S9. Consecutive CVs of PAz electropolymerization on PET-substrates in a) [Choline][TFSI] and b) [Emim][TFSI] using 50 mM azulene concentration. Potential was cycled in the range -0.7–0.9 V with 20 mV s⁻¹ scan rate until a total charge of 1.0 C was accumulated. Arrows show the cycling direction, and first cycle is presented in red. The insets show the p-doping response of the as-prepared films in 3-electrode configuration using [Choline][TFSI] as electrolyte solution at 50 mV s⁻¹ scan rate.

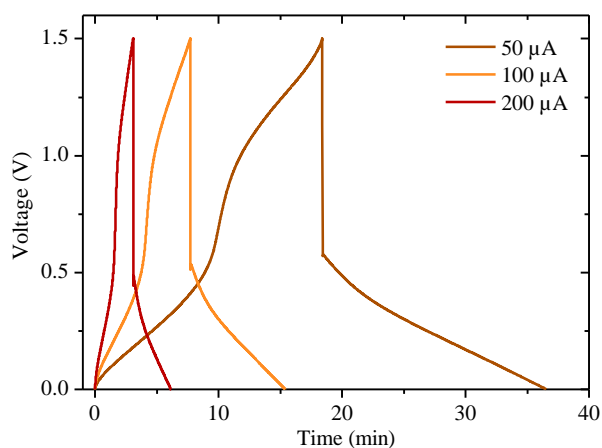


Fig. S10. Charge-discharge curves of symmetric supercapacitors prepared with two PAz-electrodes.