

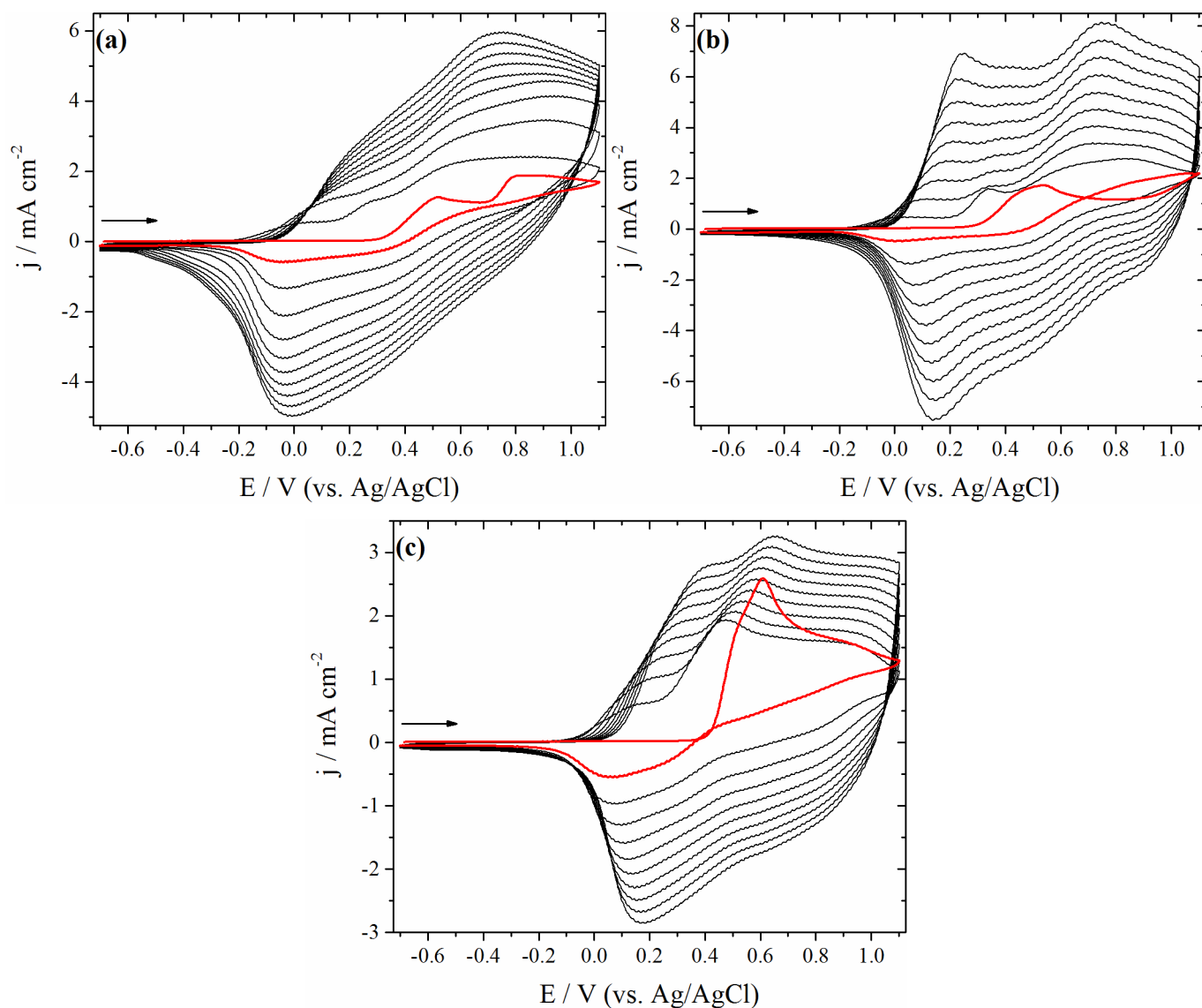
## ELECTROPOLYMERIZED POLYAZULENE AS ACTIVE MATERIAL IN FLEXIBLE SUPERCAPACITORS

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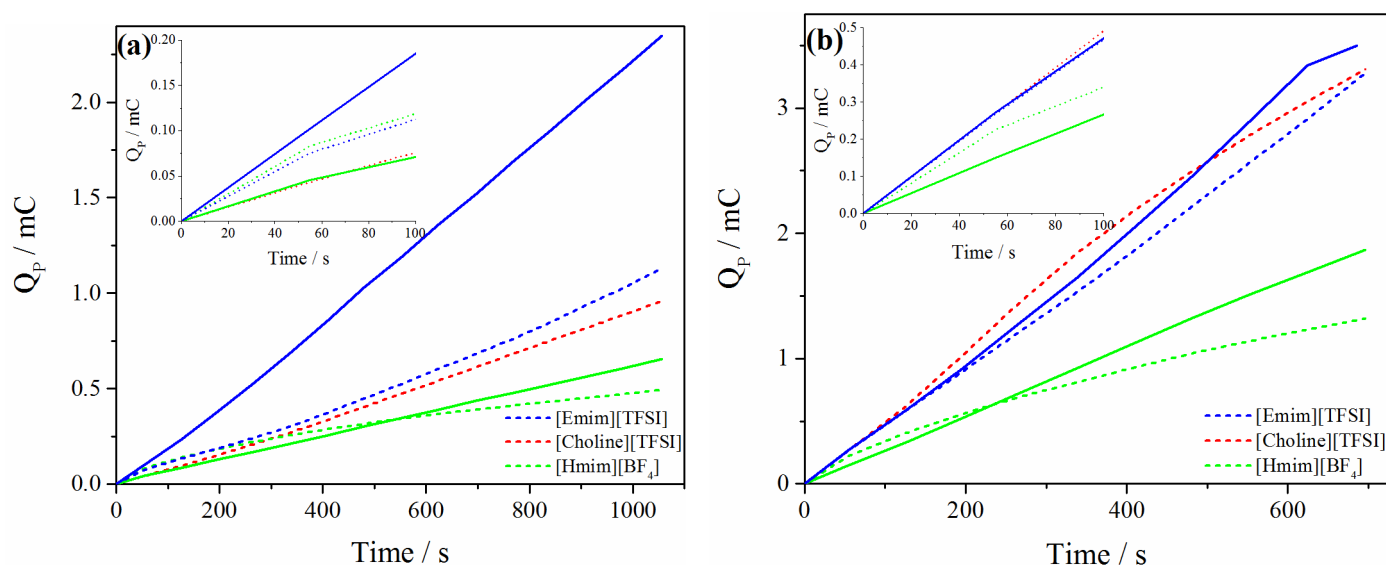
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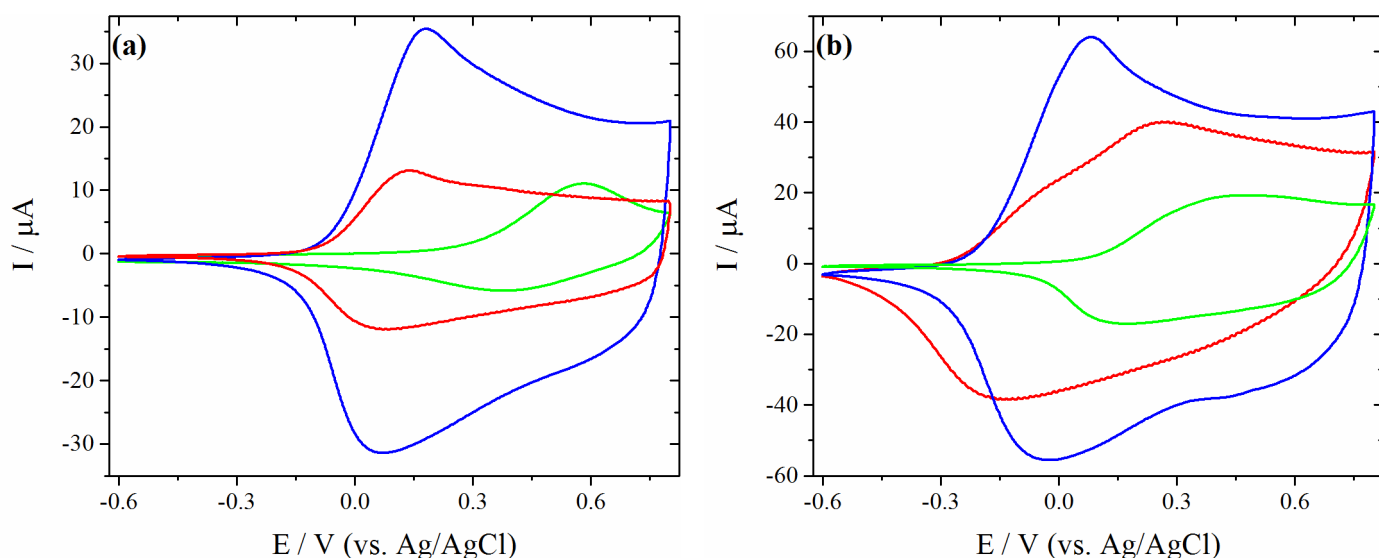
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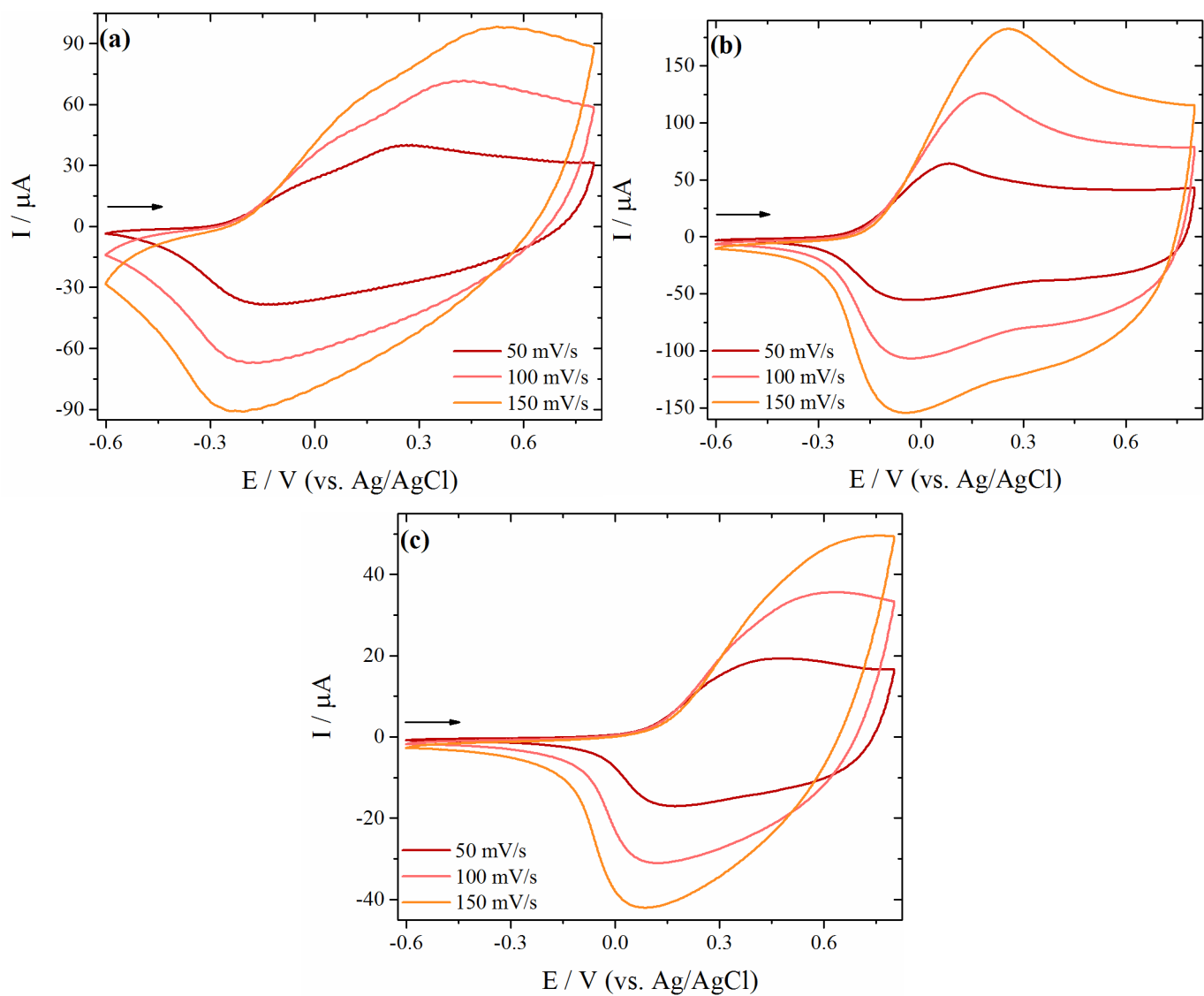
**Fig. S1.** Consecutive CVs of PAz electropolymerization in a) [Choline][TFSI], b) [Emim][TFSI], and c) [Hmim][BF<sub>4</sub>]. Monomer concentration was 50 mM and 10 consecutive cycles were recorded in the potential range -0.7–1.1 V at 50 mV s<sup>-1</sup> scan rate. Polymerizations were conducted at 32 °C. Arrows show the cycling direction, and first cycle is presented in red.



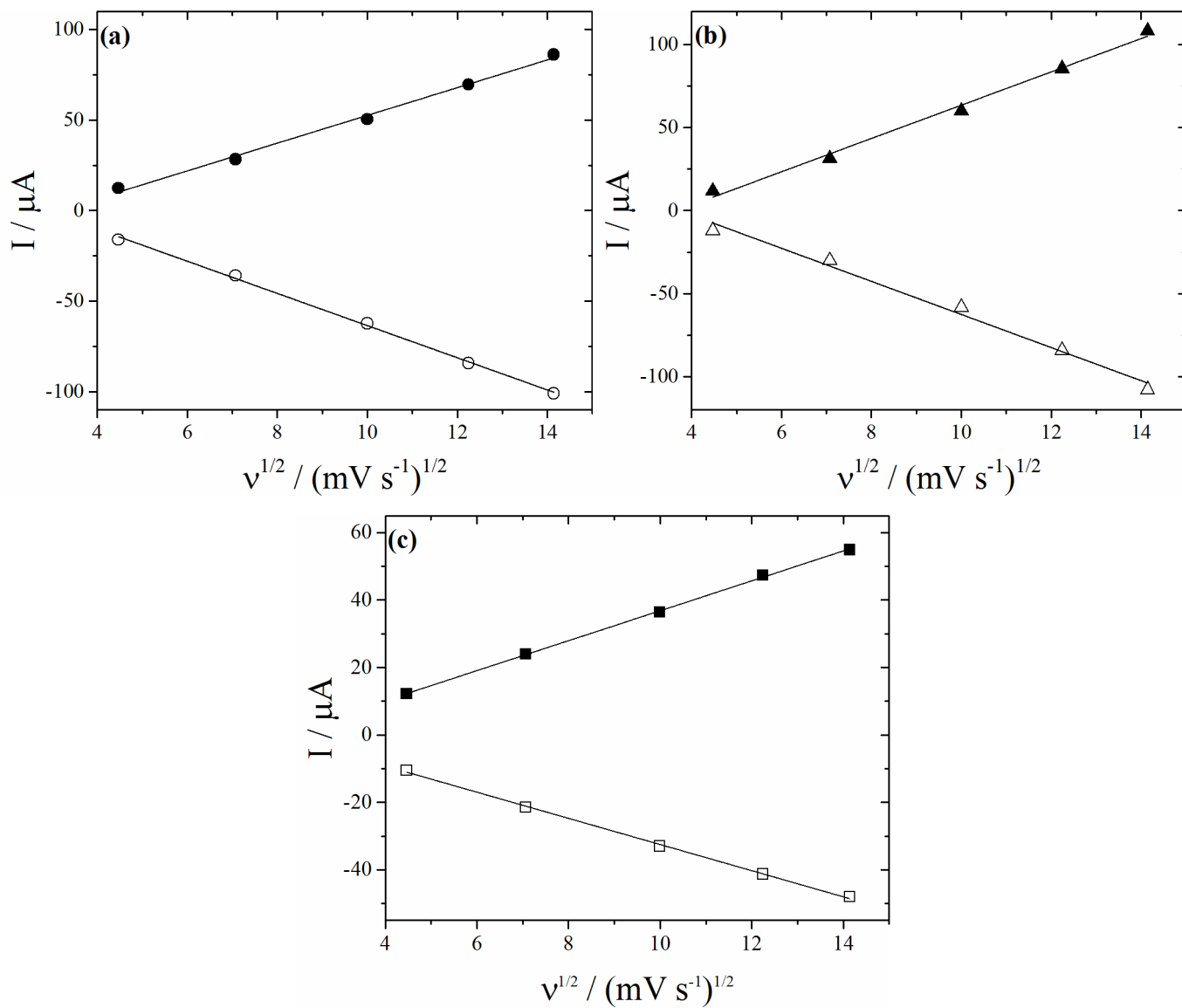
**Fig. S2.** The polymerization charge in different conditions. In a) 20 mM and in b) 50 mM monomer concentration was used. Polymerizations where heating (32 °C) was applied are depicted with dashed lines and solid lines represent polymerizations in room temperature. [Choline][TFSI] system was always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



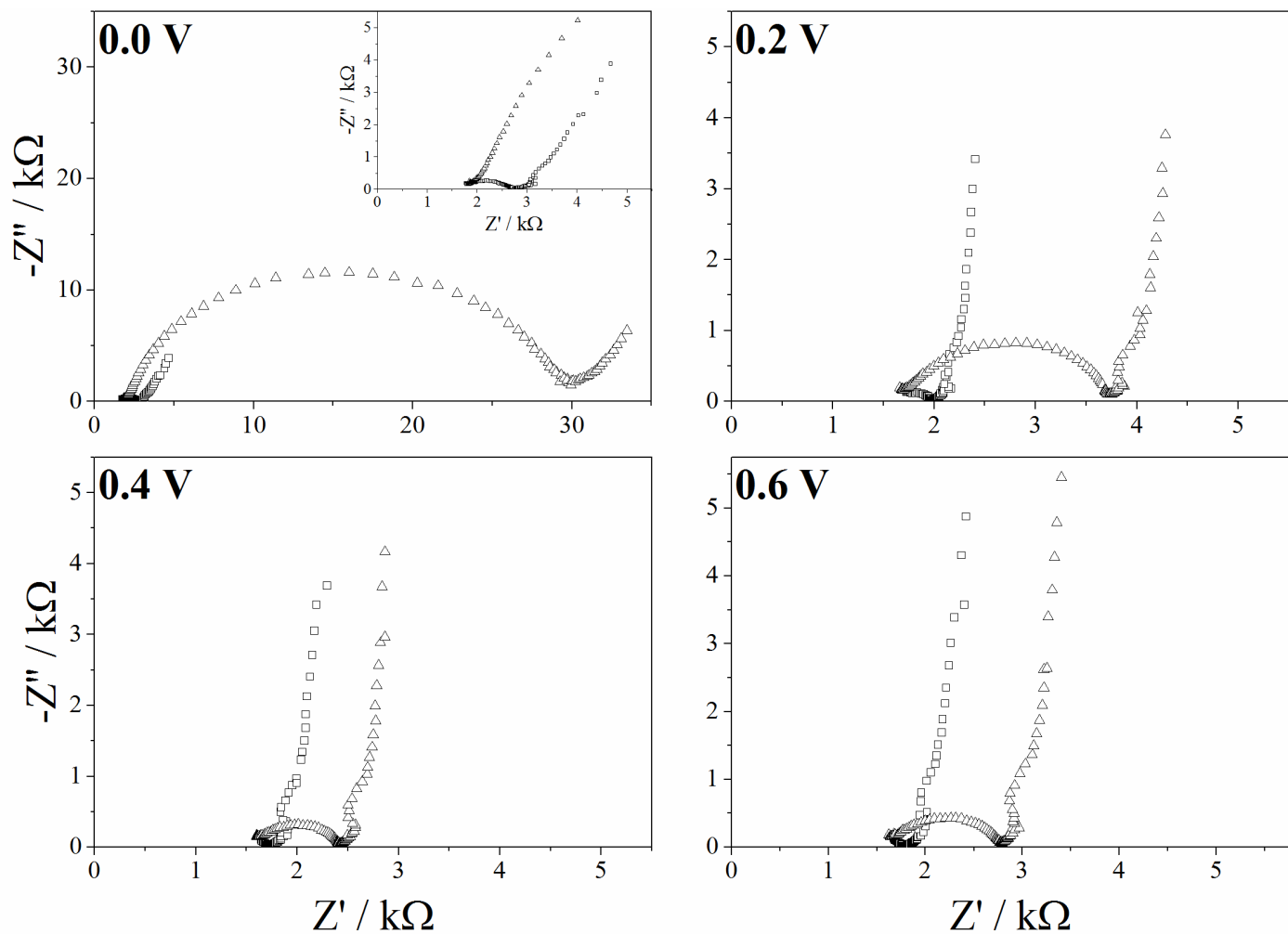
**Fig. S3.** CVs of PAz p-doping in [Choline][TFSI] (red), [Emim][TFSI] (blue), and [Hmim][BF<sub>4</sub>] (green). Scan rate is 50 mV s<sup>-1</sup> and the potential window is -0.6–0.8 V. a) 20 mM monomer concentration and 15 consecutive cycles during polymerization were applied. b) 50 mM monomer concentration and 10 consecutive cycles in polymerization were applied.



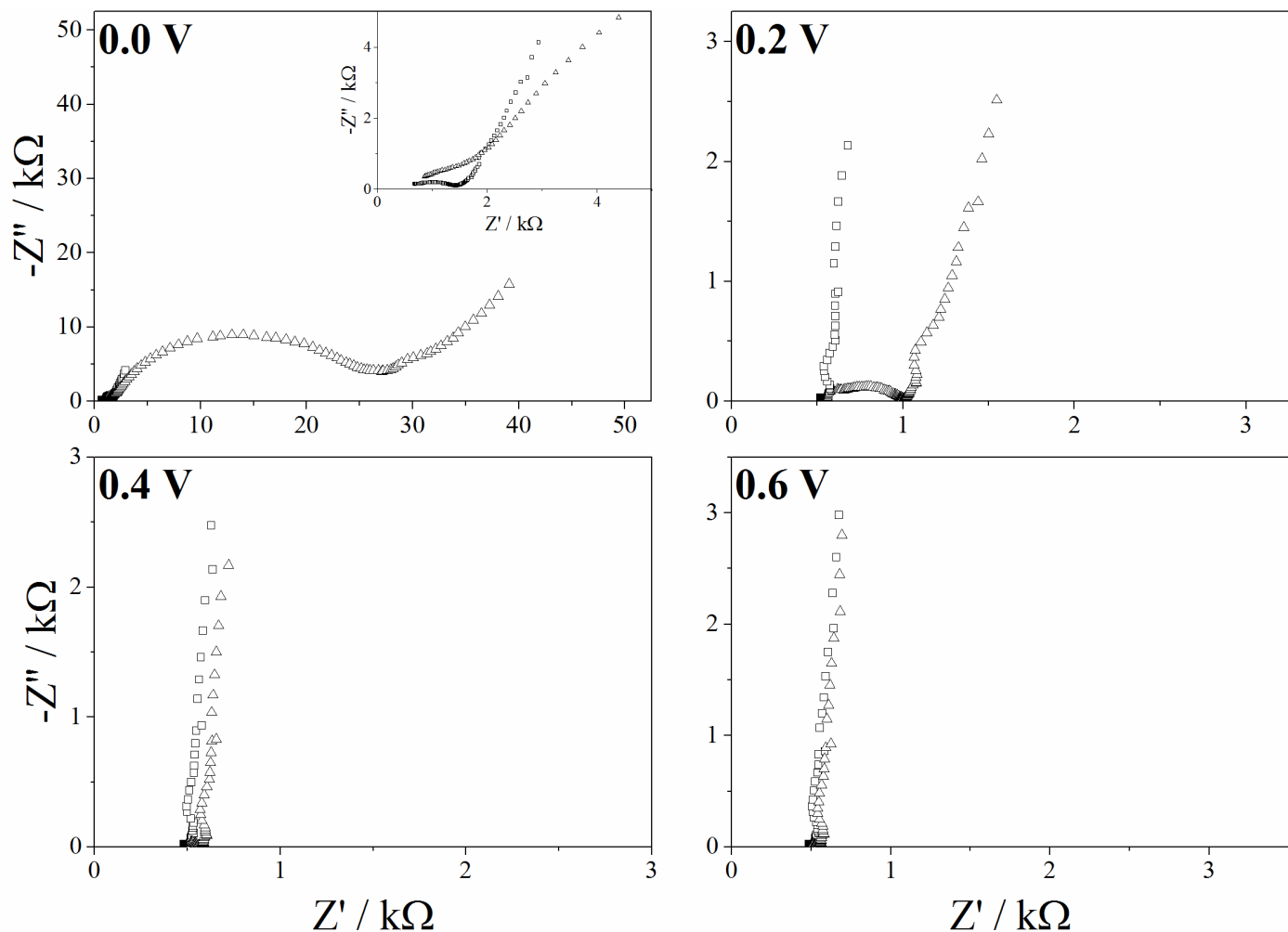
**Fig. S4.** CVs of PAz p-doping with different scan rates in a) [Choline][TFSI], b) [Emim][TFSI], and c) [Hmim][BF<sub>4</sub>].



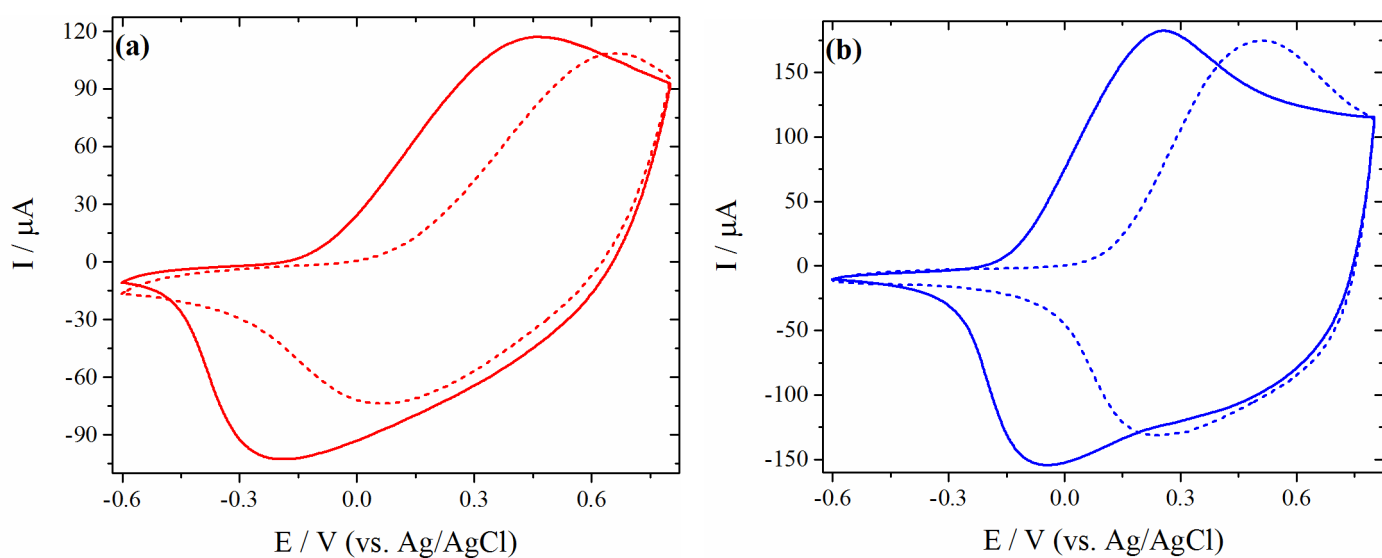
**Fig. S5.** Dependence of maximum peak current to square root of scan rate of PAz p-doping in a) [Choline][TFSI], b) [Emim][TFSI], and c) [Hmim][BF<sub>4</sub>].



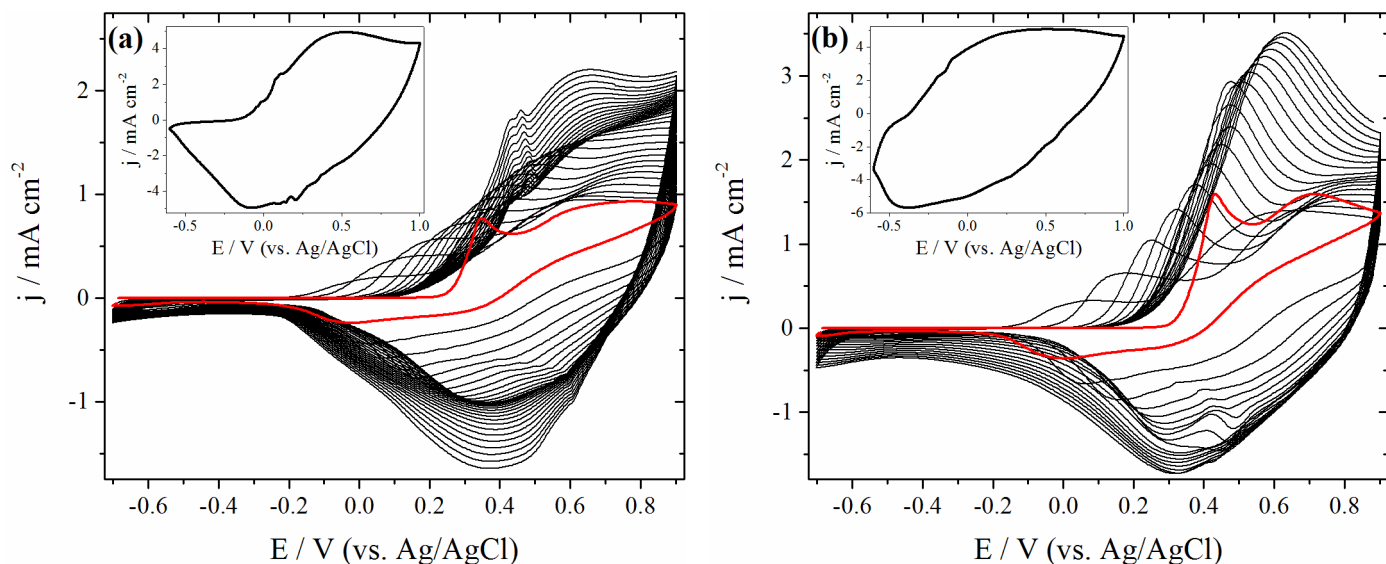
**Fig. S6.** Complex impedance plots of PAz film in [Choline][TFSI] at 0.0, 0.2, 0.4 and 0.6 V after polymerization (square) and long term cycling (triangle).



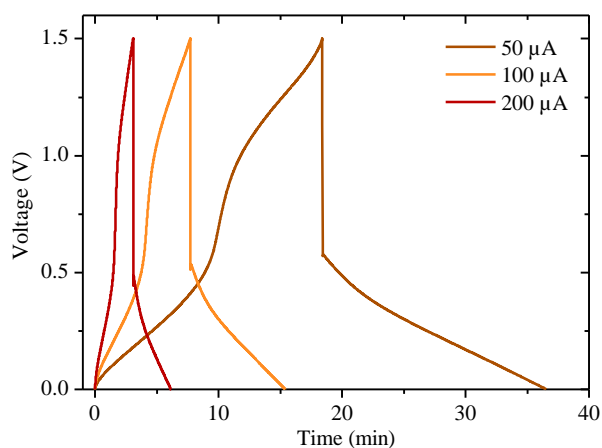
**Fig. S7.** Complex impedance plots of PAz film in [Emim][TFSI] at 0.0, 0.2, 0.4 and 0.6 V after polymerization (square) and long term cycling (triangle).



**Fig. S8.** CVs of PAz p-doping in the potential range -0.6–0.8 V with  $150 \text{ mV s}^{-1}$  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<sup>-1</sup> 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<sup>-1</sup> scan rate.



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