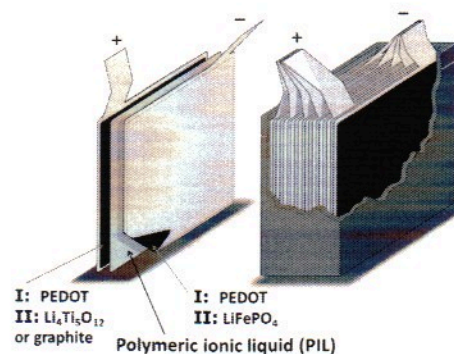
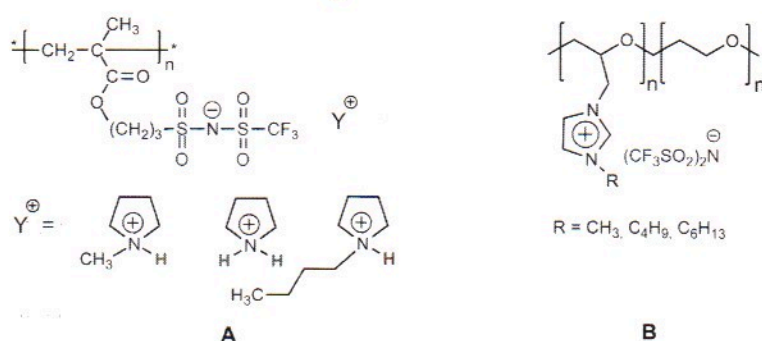


## Utilization of poly(ionic liquid)s (PILs) as separators in all-solid-state supercapacitors (SCs)

This study will comprise two strategies. The first one consists in the utilization of new anionic PILs with protic cations (Scheme 1, a) as solid electrolytes in composite supercapacitors (SCs). As it was shown recently<sup>1</sup> the protic ILs are particularly suitable for high power Li batteries (LiBs) and SCs because of the unique lithium environment present in these electrolytes. Taking this into account, their introduction in PILs (Scheme 1, a) could represent a strategy for the improvement of the properties of these electrolytes, particularly in terms of lithium mobility. It is planned to use anionic PILs with protic cations in SCs in combination with various activated carbons.



The second strategy will consist in the creation of all-polymer SCs, representing trilayer architecture: poly(3,4-ethylenedioxythiophene) (PEDOT)/PIL/PEDOT, where PEDOT will serve as an electrode and an ion-storage material, while highly conductive cationic coPILs (Scheme 1, b) will play a role of solid electrolyte. The working potential of such system was already successfully demonstrated by cooperative work of Prof. Shaplov A.S. with LPPI lab on the example of solid state ECDs<sup>2,3</sup>.



Scheme 1.

- (1) Brandt, A.; Pires, J.; Anouti, M.; Balducci, A. *Electrochimica Acta* **2013**, *108*, 226–231.
- (2) Shaplov, A. S.; Ponkratov, D. O.; Aubert, P.-H.; Lozinskaya, E. I.; Plesse, C.; Vidal, F.; Vygodskii, Y. S. *Chem. Commun.* **2014**, *50* (24), 3191.
- (3) Shaplov, A. S.; Ponkratov, D. O.; Aubert, P.-H.; Lozinskaya, E. I.; Plesse, C.; Maziz, A.; Vlasov, P. S.; Vidal, F.; Vygodskii, Y. S. *Polymer* **2014**, *55* (16), 3385–3396.