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Cation-gelator interaction at the liquid-solid interface in low molecular weight ionogel.

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The organic ionic gel (OIGs) electrolytes, also known as ionogels are one example of solidification methods for electrolytes, which allows to obtain a functional material with potential to use in wide range of electrochemical applications. The functionality of OIGs arises from the thermally reversible solidification of electrolytes and their superior ionic conductivity. To understand and to predict the properties of these systems it is important to get the knowledge about the interactions and dynamics on molecular level between the solid gelator matrix and the electrolyte solution. On the basis of our previous studies [1,2], we conclude that the enhanced conductivity of the gel phase has its origin in the interactions between the gelator matrix surface and ions. This interaction leads to creation of a thin layer near the matrix surface in which we can observe an enhanced diffusion of the ions. This enhancement in our opinion is due to change of the 3D “bulk” diffusion to 2D “surface” diffusion type. To proof this assumption the FFC relaxometry and PFG NMR diffusiometry measurements were performed on quaternary ammonium salt electrolyte and its ionogels in the function of molar concentration of the salt.

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[1] M. Bielejewski, A. Puszkarska, J. Tritt-Goc *Electrochim. Acta* 165 (2015) 122

[2] M. Bielejewski, A. Łapiński, O. Demchuk *J. Coll. Interf. Sci* 490 (2017) 279