SPECIFIC CONDUCTIVITY OF PMMA BASED GEL ELECTROLYTES CONTAINING LITHIUM SALTS

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A subject of our research was the specific electric conductivity of PMMA based gel electrolytes. Samples containing solutions of lithium salts with different molar concentration in propylene carbonate were investigated. These samples was mixed with monomeric and oligomeric methylmethacrylate [1, 2], after that we have obtained an elastic and homogenous polymer with good optical properties.

Four-point method was used for the estimation of specific electric conductivity at the voltage of 1 V and frequency 10 kHz in the course of 10 days [3, 4]. They were prepared from solutions of $LiCIO_4$ and concentrations 0.25M, 0.5M, 0.75M and 1M (labelled as Sample 1 to Sample 4).

The specific conductivity σ changes according to the empirical formulas:

 $\sigma = 1.89 \cdot 10^{-4} c(\text{LiCIO}_4) + 3.0 \cdot 10^{-4}$ (1) with the correlation coefficient *R* = 0.6326 for the fresh sample and $\sigma = 4.86 \cdot 10^{-5} c(\text{LiCIO}_4) + 1.57 \cdot 10^{-4}$ (2)

with the correlation coefficient R = 0.9862 for the sample of age 10 days (σ in S.cm⁻¹ and *c* in mol.l⁻¹). This investigation will proceed for longer time intervals.



Fig. 1 Influence of the salt concentration on the specific conductivity

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