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Dynamics of Poly(ethyleneoxide) in the Presence of LiTFSI: Neutron Spin Echo and Dielectric Spectroscopy Study CHANGWOO DO, Neutron Scattering Directorate, Oak Ridge National Laboratory, Oak Ridge, TN 37831, USA, XIAO-GUANG SUN, Chemical Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831, USA, MICHAEL OHL, JÜRGEN ALLGAIER, Jülich Centre for Neutron Science, Forschungszentrum Jülich, 52425 Jülich, Germany, MARION GÖTZ, PETER LUNKENHEIMER, ALOIS LOIDL, Center for Electronic Correlations and Magnetism, University of Augsburg, 86135 Augsburg, Germany, DIETER RICHTER, Jülich Centre for Neutron Science, Forschungszentrum Jülich, 52425 Jülich, Germany — Rechargeable lithium-ion batteries based on solid polymer electrolytes (SPEs) offer many advantages over their liquid counterparts. In comparison to a liquid electrolyte, the solid polymer is less flammable and more environmentally friendly. Issues such as microscopic dynamics of lithium ions and their dependence on their polymeric matrix are known to play a key role in determining the ionic conductivity in SPEs. Therefore, understanding of the microscopic dynamic characteristics of the lithium ions in relation with the dynamics of surrounding polymeric matrix is a crucial step for the interpretation of their transportation behavior and ultimately toward the control of their properties. Here, we investigated dynamics of poly(ethylene oxide) (PEO) in the presence of LiTFSI using neutron spin echo and dielectric spectroscopy techniques. Experimental results suggest that the dynamics of PEO is dramatically slowed down and strong correlation between ion transportation and alpha-relaxation of PEO.

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