

Abstract Submitted
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β -NMR Measurements of Lithium Ion Transport in Thin Films of Pure and Lithium-Salt-Doped Poly(ethylene oxide) IAIN MCKENZIE, TRIUMF, MASASHI HARADA, None, DAVID L. CORTIE, ROBERT F. KIEFL, University of British Columbia, C.D. PHILIP LEVY, TRIUMF, W. ANDREW MACFARLANE, RYAN M.L. MCFADDEN, University of British Columbia, GERALD D. MORRIS, TRIUMF, SHIN-ICHI OGATA, Toyota Central Research and Development Laboratories, Inc., MATTHEW R. PEARSON, TRIUMF, JUN SUGIYAMA, Toyota Central Research and Development Laboratories, Inc. — β -Detected nuclear spin relaxation of $^8\text{Li}^+$ has been used to study the microscopic diffusion of lithium ions in thin films of poly(ethylene oxide) (PEO), PEO with lithium bis(trifluoromethanesulfonyl)imide (LiTFSI), PEO with lithium triflate (LiTf) and PEO with lithium trifluoroacetic acid (LiTFA) with monomer-to-salt ratios of 8.3:1. Hopping of Li^+ above ~ 250 K follows an Arrhenius law in all of the films. Diffusion of Li^+ is fastest in pure PEO and decreases in order LiTFSI $>$ LiTf $>$ LiTFA. We observed the activation energy for hopping (E_A) and the intrinsic hop rate (τ_0^{-1}) both increasing in order LiTFA $<$ LiTf $<$ LiTFSI $<$ PEO but the larger τ_0^{-1} outweighs the larger E_A and results in Li^+ motion being fastest in the pure polymer. The results will be discussed in terms of the ionicity of the salt.

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