Light Scattering Investigation of Dynamic and Viscoelastic Properties of Entangled Poly(ethylene oxide) Melts in the Presence of LiClO4

SHUFU PENG, J. C. SELSER, R. BOGOSLOVOV, G. PIET, University of Nevada Las Vegas — Laser light scattering measurements are employed to investigate the dynamics of entangled poly(ethylene oxide) with and without lithium perchlorate in melts. The single-exponential ACF relaxation mode was observed and exhibited $q^2$ dependence with and without salt in melts; behavior interpreted as due to the relaxation of a transient PEO network. The results of activation energy from the dynamic light scattering and viscometry measurements were compared. Static scattering measurements indicated that the structure factor exhibits a universal power law $I(q) \sim q^{-2.0\pm0.1}$ in the melts; which agree with the prediction of the percolation theory. Furthermore, the results revealed that the level of entanglement of PEO chains is different depending on the existence of LiClO$_4$.

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