

Abstract Submitted
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The Effect of Sulfonation and Neutralization on the Dynamics of Zn Neutralized Sulfonated Polystyrene Ionomers ALICIA CASTAGNA, The Pennsylvania State University, WENQIN WANG, KAREN I. WINEY, University of Pennsylvania, JAMES RUNT, The Pennsylvania State University — The effect of sulfonation and neutralization levels on structure and dynamics of Zn neutralized sulfonated polystyrene (SPS) ionomers were investigated using scanning transmission electron microscopy (STEM), X-ray scattering, and dielectric relaxation spectroscopy. STEM and X-ray scattering revealed the presence of spherical aggregates 2 nm in diameter. Successful fitting of the scattering data to the Kinning-Thomas modified hard sphere model revealed that aggregate size is independent of degree of sulfonation and neutralization level, and that aggregate composition becomes increasingly ionic with increasing neutralization. Two segmental relaxations were identified in dielectric loss spectra corresponding to cooperative motion of chain segments in the unrestricted matrix and motions of chain segments restricted by aggregates. A Maxwell-Wagner-Sillars interfacial polarization process was revealed, with relaxation times that were in good agreement with predictions from a simple model of dispersed ionic spheres.

Alicia Castagna
The Pennsylvania State University

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