

Abstract Submitted  
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**Origin of the low-q X-ray scattering behavior in poly(ethylene oxide)-based ionomers**<sup>1</sup> AMANDA MCDERMOTT, GREGORY TUDRYN, Penn State University, JAN ILAVSKY, Argonne National Laboratory, ANDREW ALLEN, National Institute of Standards and Technology, RALPH COLBY, JAMES RUNT, Penn State University — Ultra-small-angle X-ray scattering is used to investigate a series of single-ion-conducting PEO-based polyester copolymers with varying amounts of ionic sulfonate groups covalently bound to the polymer chains. We observe a low-q scattering component found in many polymers, including the neutral version of our material, and generally attributed to impurities. However, both the intensity and power-law slope of this scattering intensity upturn increase at high ion contents, indicating that it contains structural information about intentionally added ions. We discuss the interpretation of this feature with insight from atomic emission spectrophotometry, a critical ion fluctuation model, and the X-ray scattering behavior observed with several different cations and a range of concentrations.

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