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Plasticizer Influence on Ionic Morphology and Transport in PEO Ionomers MICHAEL O'REILLY, University of Pennsylvania, HANQING MASSER, DANIEL KING, PAUL PAINTER, RALPH COLBY, JAMES RUNT, Pennsylvania State University, KAREN WINEY, University of Pennsylvania — Sulfonated poly(ethylene oxide) ionomers have been blended with a miscible, oligomeric poly(ethylene glycol) in order to study the effect of plasticizers on ionomer performance. Plasticizers can increase ionic conductivity in ionomers by depressing the glass transition temperature and dissolving ionic aggregates. In this study, the relative volume fractions of ionic aggregates in various blend compositions is investigated by curve fitting the X-ray scattering aggregate peak. Two fitting parameters are utilized to quantify aggregate composition, peak area and peak position. Fitting results conclude that plasticizer content dilutes and dissolves ionic aggregates, providing higher conducting ion density than comparable neat ionomers. Dielectric relaxation spectroscopy data confirms that ionic conductivity improves with plasticizer content. Similar curve fitting methods were executed for FT-IR signals, and quantification of aggregate structure is compared with X-ray scattering.

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