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Influence of Neutralization Methods on the Self-Assembly of Nanoscale Ionic Aggregates in Ionomers. NICHOLAS BENETATOS, KAREN WINEY, Department of Materials Science and Engineering, University of Pennsylvania, Philadelphia, Pa, 19104 — Recent results show that scanning transmission electron microscopy (STEM) and small angle x-ray scattering (SAXS) have been used to obtain complementary morphological information for solvent cast poly(styrene-*ran*-methacrylic acid) (SMAA) ionomers neutralized with copper. In order to systematically explore the affect of neutralization methods on the nanoscale morphology, materials were isolated by three different methods: solvent casting, solution annealing, and precipitation. Each of these methods allows for a different rate of polymer structure formation. While solvent cast and solution annealed Cu-SMAA films exhibit isotropic ionomer scattering peaks and similar morphologies in STEM, the precipitated powder shows no scattered intensity in the region of the ionomer peak.. These data suggest that isolating the polymer by precipitation induces a metastable morphology in which the ionic aggregates are only partially formed or are not uniformly distributed throughout the material. Upon thermal treatment, the scattering pattern of the precipitated powder begins to resemble that of the solvent cast films. SAXS and STEM experiments are underway to further investigate the nanoscale self-assembly mechanism.

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