

Abstract Submitted
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Investigating the morphology of ionic graft copolymers using SAXS and SANS techniques RASOUL NARIMANI, EMILY M.W. TSANG, AMI YANG, Simon Fraser Univeristy, LAURENT RUBATAT, Université de Pau et des Pays de l'Adour, STEVEN HOLDCROFT, BARBARA FRISKEN, Simon Fraser Univeristy — We have studied the morphology of an ion-containing graft copolymer system using small angle x-ray and neutron scattering (SAXS and SANS), in addition to transmission electron microscopy (TEM). Our SAXS measurements on dry samples reveal that the poly(vinylidene difluoride) backbone of this copolymer forms quasi-spherical domains embedded in a continuous matrix of the poly(styrene) side chains. By analyzing the data we are able to calculate the size and spacing between these domains. According to SANS measurements, the ionic groups aggregate to form water-rich domains when the samples are hydrated. By comparing the SANS and SAXS results we find that the swelling properties at the nano-scale are consistent with bulk membrane properties. These results provide insight into the proton conductivity of these materials.

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