

Abstract Submitted  
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**Dynamics of water in sulfonated poly(phenylene) membranes**  
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NELIUS, University of Connecticut — The dynamics of water in networks formed by  
highly rigid ionic polymers, sulfonated poly(phenylene) as observed by quasi elastic  
neutron scattering (QENS) is presented. These rigid ionic polymers have potential  
as effective ion exchange membranes with impact on a large number of applications  
from water purification to clean energy, where its rigidity distinguishes it from other  
ionic polymers. Its transport characteristics are affected by its rigidity as well as by  
direct interactions with the solvent. Our QENS studies as a function of sulfonation  
levels, temperature and solvent content have shown that on the time scale of the  
measurement, the polymers are rigid. While macroscopically all samples swell, and  
transport water, the water molecules appear locally rather confined. Water however  
remind non-frozen to subzero temperatures. The results will be discussed in view of  
theoretical models including continues diffusion and hopping of solvent molecules.

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