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Dynamics of water and ethanol intercalated in graphene oxide.[1]
GOBIN ACHARYA, Wayne State University, EUGENE MAMONTOV, Oak Ridge National Lab (ORNL), MADHUSUDAN TYAGI, Nist Centre for Neutron Research (NCNR), PETER HOFFMANN, Wayne State University — Graphene oxide (GO) membranes were recently suggested for applications in separation of ethanol from water using a vapor permeation method. Understanding microscopic diffusivity of water and ethanol in graphene oxide membranes is important for separations applications. We will discuss the dynamics of water and ethanol between the direction perpendicular to the plane and in-plane direction. We used quasi elastic neutron scattering (QENS) to measure the temperature dependence of the diffusivity of water and ethanol, and its anisotropy by the utilization of Q-dependence of QENS signals obtained from BASIS at Oak Ridge National Lab. We will also discuss how dynamic measurements from QENS can be correlated with atomic force microscopy measurements of the temperature dependence of viscosity in water/ethanol confined in GO.

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