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Poroelastic characterization of ultrathin water purification membrane layers EDWIN CHAN, Materials Science and Engineering Division, National Institute of Standards and Technology, 100 Bureau Drive, Gaithersburg, MD 20899 — The selective layer of pressure-induced water desalination membranes is a highly crosslinked aromatic polyamide ultrathin film that discriminates salt from water based on differences in diffusion coefficients. However, measuring transport properties of such ultrathin layer is difficult. In this presentation, poroelastic relaxation indentation (PRI) is demonstrated as a simple indentation based technique for measuring the transport properties of these ultrathin layers. Using PRI, the transport properties of four model crosslinked PA ultrathin films, synthesized via molecular layer-by-layer (mLbL), are characterized to show that the water diffusion coefficient, the volume fraction of water lost due to deswelling, as well as the intrinsic permeability can be simultaneously quantified using this one simple testing approach.

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