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Determination of Neutral Solute Permeabilities and Membrane Selectivities through PPO/PAGE Copolymer Membranes via *in situ* ATR FTIR Spectroscopy?[1] BREANNA M DOBYNS, BRYAN S BECKINGHAM, Auburn University — Polymeric membranes are used in a wide range of applications, from biomedical applications to industrial separations to fuel cells. Solute permeability and selectivity are of fundamental interest when considering a membrane material for a particular application. Here, we examine the transport of aqueous species through neutral polymer membranes. We synthesize copolymers of varying composition of poly(allyl glycidyl ether) (PAGE) and poly(propylene oxide) (PPO) via potassium alkoxide initiated anionic ring opening polymerization. The physical properties of these copolymers can be tuned through the relative composition and the pendent allyl group in PAGE affords the inclusion of additional functionalities via click-chemistry techniques and crosslinking via UV-irradiation. The copolymers are pressed into membranes and cross-linked prior to hydration and placement in a custom-built diffusion cell outfitted with Attenuated-Total-Reflectance Fourier Transform Infrared spectroscopy. We report solute permeabilities of methanol, isopropanol, and acetone through these membranes and the calculated binary selectivities of these components. Lastly, we conduct multicomponent experiments and compare the selectivities and permeabilities to the single component experiments.

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