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Design, Synthesis, and Evaluation of Non-Porous, Hydrophilic Membranes SADIE WHITE, University of Pennsylvania Department of Materials Science and Engineering, MICHAEL FRYD, University of Pennsylvania Department of Chemistry, BRADFORD WAYLAND, University of Pennsylvania Department of Chemistry, RUSSELL COMPOSTO, University of Pennsylvania Department of Materials Science and Engineering, KAREN WINEY, University of Pennsylvania Department of Materials Science and Engineering — The use of membranes in biological sciences, electrochemistry, and separation technologies is widely expanding. In this investigation, the water flux and filtration capacities of polyacrylamide-based hydrogel membranes were studied under gravity- and forced filtration processes. The crosslinked membranes were prepared via room-temperature aqueous free radical polymerization, initiated with ammonium persulfate. The crosslinker hydrophilicity and concentration (between 0.5 and 10 mole percent), as well as the membrane thickness, were varied to determine the dependence of gel swelling and water flux on these factors. Suspensions of narrowly-dispersed pigment particles (with a diameter of approximately 200 nanometers) were analyzed with light scattering before and after filtration to determine how effectively the membranes remove particulate matter in this size range. Ongoing work will broaden the investigation to include similar water throughput and filtration studies on crosslinked poly(acrylic acid) membranes.

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