245b Novel Polymeric Membrane for Dehydration of Organic Solvents

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Pervaporation has emerged as an economically viable alternative technology for dehydration of organic solvents, removal of organic compounds and organic/organic separations. Development of a membrane system with suitable flux and selectivity characteristics plays a critical role in achieving practical utility for this process. The present study is focused on the development of high performance polymeric membranes for the dehydration of organic solvents (ethanol, isopropanol, methanol, acetone) via pervaporation. Polymer membranes for dehydration generally perform poorly, exhibiting low flux at low water content due to reduced swelling. The novel membrane system to be described here consists of a mixture of poly(vinyl alcohol) and poly(allyl amine) hydrochloride, that provides high water fluxes and selectivity for water relative to the organic solvent. Higher water fluxes were obtained even at low water content ethanol feeds than for typical polymeric pervaporation dehydration membranes. The effect of polymer molecular weights, type and relative composition of each polymer, on membrane stability and performance is compared for the dehydration of ethanol on a pervaporation bench scale unit. The effects of various other parameters such as duration of membrane curing, feed temperature and feed water content will also be discussed.