Mixed matrix membrane prepared from PVA with NaA zeolite for Pervaporation of water-ethanol mixtures

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Pervaporation is known to be a low energy consumption process since it needs only an electric power to maintain the permeate side in vacuum. Also, the pervaporation is an environmentally clean technology because it does not use the third material such as an entrainer for either an azeotropic distillation or an extractive distillation.
In this study, NaA zeolite particles are hydrothermaly synthesized and PVA-NaA zeolite composite membranes are prepared with a mixture of synthesized NaA zeolite particles and PVA. They are used to separate ethanol from the aqueous solution. Pervaporation characteristics such as a permeation flux and a separation factor are investigated in terms of the feed temperature and the weight % of NaA zeolite particles in the membrane. A ethanol mixture at 0.01, 0.02, 0.03, 0.05 wt% was used to feed the cell, while the pressure of permeation side was about 0.5 torr.