Incorporation of Multi-walled Carbon Nanotubes to Poly(vinyl alcohol) Membranes for Use in Pervaporation of Water/Ethanol Mixtures

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Multi-walled carbon nanotubes (MWNTs)/PVA blend membranes were prepared for pervaporation application by the solution casting, then followed by the complete solvent evaporation at room temperatures. Before making the blend membranes, MWNTs were first treated with strong acid to make them well dispersed in water for the purpose of the preparation of homogeneous MWNTs/PVA blend solutions. The pervaporation properties of MWNTs/PVA blend membranes were studied, separating water/ethanol mixtures. The permeation flux was increased with MWNTs contents, whereas the separation factor was maintained upon addition of MWNTs until 1.0 wt% and then decreased. This result suggests that two factors, the crystallinity of the membrane and diameter of nanotubes have affected the performance of membrane.