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Effect of multi wall carbon nanotube on vacuum membrane distillation performance of microporous polyvinylidene flouride membranes

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Abstract

Membrane technology has gradually become a popular separation technology over the past few decades. There are many significant advantages to use membranes for industrial processes. MWCNT possible locations for small molecules are absorbed. Since the transmission properties of CNTs is always the key issue is to improve the properties of polymeric membranes to separate the CNTs are able to transfer the molecules studied. MWCNT/PVDF membranes were fabricated using solution casting method. The synthesized membranes were structurally characterized using Fourier transform infrared spectroscopy, scanning electron microscope and thickness of membrane. The membrane performance was tested by vacuum membrane distillation setup. SEM images showed appropriate distribution of multi wall carbon nanotubes within polyvinylidene fluoride matrix. FTIR analysis showed a physically linking between the nanoparticles and the polymeric matrix of the membrane. Thickness of membranes wasabout 40,50 µm. The MD performance of neat PVDF and MWCNT/PVDF flat sheet membranes with the approximate contact area of 32 cm^2 was examined in a vacuum membrane distillation setup. The pure water flux for PVDF/MWCNT and neat PVDF membranes was 8.44 ,11.25(kg/m^2h), Respectively. Pure water flux test showed that increasing the nanoparticle, pore wetting is reduced. so, the hydrophobicity is increased.

Keywords : *Polyvinylidene fluoride, Multi wall carbon nanotubes, Nano composite membranes, water permeation, polymeric membrane*

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