



Fabrication of ternary polyvinyl alcohol/tetraethyl orthosilicate/silicotungstic acid hybrid membranes for pervaporation dehydration of alcohol

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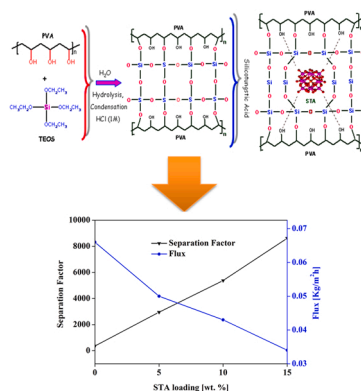
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HIGHLIGHTS

- Highly water selective PVA/TEOS membranes with various STA loadings are prepared via solution-casting method.
- STA incorporated PVA/TEOS nanocomposite membranes exhibited superior PV performance when compared with bare PVA/TEOS membrane.
- Permeation flux value is reached to 0.067 Kg/m².h in one of the fabricated membranes with a maximum separation factor 8622 at 10 wt% feed water composition and 30 °C operating temperature.

GRAPHICAL ABSTRACT



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ABSTRACT

Herein, we present simple method of fabrication and pervaporation application of organic/inorganic ternary nanocomposite membranes. These are obtained from novel combination of poly(vinyl alcohol)/tetraethyl orthosilicate (PVA/TEOS) along with incorporation of silicotungstic acid (STA) nanoparticles *via* solution casting method. Physico-chemical structure has been confirmed by using various characterization tools. Pervaporation efficiency of these new nanocomposite membranes in terms of flux and separation factor is investigated for one of the important processes of ethanol separation (azeotropic mixture separation) from its aqueous solution. Dramatically boosted pervaporation separation efficiency by PVA/TEOS membranes has been observed as a

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