

عنوان مقاله:

Zwitterion Embedded Thin Film Composite Membrane for Oily Wastewater Treatment

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خلاصه مقاله:

The recent development in oil and gas industry increases the production and consumption of oil. The enormous amount of oily wastewater produced is urged to be treated to prevent humanity and environment from being threatened. Membrane technology is an appealing alternative for oily wastewater treatment due to its design simplicity, energy efficiency and environmentally benign approach. In this study, a poly[3-(N-2-methacryloylxyethyl-N,N-dimethyl)-ammonatopropanesulfonate] (PMAPS) incorporated thin film composite (TFC) membrane with excellent anti-fouling properties was fabricated for oil removal from oily wastewater through forward osmosis process. PMAPS was blended with the polyethersulfone (PES) dope solution and casted into PES support layer. The TFC was fabricated via interfacial polymerization (IP) technique to form a thin film polyamide (PA) layer atop of a PES support layer. The PMAPS incorporated TFC membranes has been characterized for their morphology, surface hydrophilicity and charges. The incorporation of PMAPS was compatible with the PES polymer matrix hence lead to defect-free thin film formation. Prior to the hydrophilicity of PMAPS, the resultant TFC membrane exhibited a high water flux of 10.3 ± 0.3 L/m².h and oil flux of 9.6 ± 0.8 L/m².h, reverse salt flux of 1.3 ± 0.4 L/m².h under FO mode using emulsified oily solution as feed solution and 2M NaCl as draw solution using active layer-feed solution (AL-FS) orientation. 99% of oil rejection was obtained. Also, PMAPS incorporated TFC membrane was able to outperform neat TFC membrane .with lower fouling propensity for oily waste treatment

کلمات کلیدی:

Forward Osmosis, thin film composite membrane, Oily wastewater, zwitterion

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