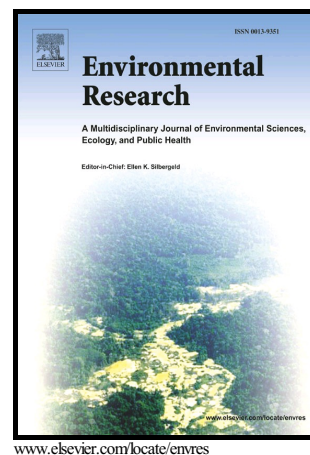


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Fluorographite-co-Polydimethylsiloxane coated polyvinylidene-fluoride membrane for desalination of highly saline water with humic acid in direct contact membrane distillation

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Abstract

Membranes with amphiphobic properties are crucial for desalination of concentrated saline water with organic foulant by membrane distillation. In this research, we coated Fluorographite (FGi) particles on polyvinylidene-fluoride (PVDF) flat sheet membranes with 0.8% v/v polydimethylsiloxane (PDMS) as binder by filtration coating method. We evaluated its amphiphobicity via contact angles which were observed by DI water, canola oil and organic solutions as mimicking for oleophobicity. Surface modifications by FGi particles on the surface of membranes was introduced with PDMS binder which brought bifunctionality of amphiphobicity to enhance hydrophobicity and oleophobicity. We also investigated performance of coated membranes in direct contact membrane distillation (DCMD) with 1 molar concentrated NaCl solution along with humic acid being organic foulant and compared with virgin membrane (M1 membrane) and Liquid entry pressure (LEP) was also evaluated. LEP was measured by dynamic method which shown considerable improvement in coated membranes. M3 membrane

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