Superhydrophobic Modification of Ceramic Membranes for Vacuum Membrane Distillation

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Superhydrophobic Modification of Ceramic Membranes for Vacuum Membrane Distillation[☆]

Yanhui Yang, Qianqian Liu, Haizhi Wang, Fusheng Ding, Guoshan Jin, Chunxi Li, Hong Meng[1*]

College of Chemical Engineering, Beijing University of Chemical Technology, Beijing 100029, China

Abstract: The hydrophobically modified ceramic membranes have great potential for energy-efficient membrane distillation. In this work, flat-sheet ceramic membranes with a superhydrophobic surface were fabricated by grafting 1*H*,1*H*,2*H*,2*H*-perfluorooctyltrichlorosilane or 1*H*,1*H*,2*H*,2*H*-perfluorodecyltriethoxysilane and followed by ultraviolet irradiation. The surface water contact angle was improved from 46° of original ceramic membrane to 159°, which exhibited a stable and excellent superhydrophobic effect. The modified membranes showed a high flux of 27.28 $kg \cdot m^{-2} \cdot h^{-1}$ and simultaneously maintained an excellent retention rate of 99.99%, when used in vacuum membrane distillation process for treatment of a 1 wt% NaCl (75°C) aqueous solution. This results suggested that superhydrophobic modification of ceramic surface is a facile

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* Corresponding author: menghong@mail.buct.edu.cn (H. Meng), Fax: 86-10-64410308.