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Jie Yao

National Engineering Center of Urban Water Resources, China

Harbin Institute of Technology, China

Hao Sun

Enhanced membrane distillation performance of PDMS/PVDF hollow fiber composite membrane for phenols removal from coal gasification wastewater

Polydimethylsiloxane/poly (vinylidene fluoride) (PDMS/PVDF) hollow fiber composite membranes were prepared through the non-solvent induced phase separation process for the vacuum membrane distillation to removal of phenols from coal gasification wastewater. The effects of membrane composition, system temperature, phase flow speed and pressure on the mass transfer coefficient for phenol through the membrane were invested in pilot-scale experiments. Compared with the pure PVDF membrane, PDMS/PVDF membrane had higher hydrophobicity for both the membrane surface and the inside porous and better phenols permeability performance in membrane distillation process. The composite membrane with a PDMS/PVDF mass ratio 1:10 exhibited a normalized phenols flux of 38.07 g/(m²h) and a separation factor of 5.3, which were both 1.5 times higher than that of pure PVDF membrane. Therefore, the developed composite membrane is a promising candidate for practical applications in phenols removal process.

Biography

Jie Yao completed his PhD from Harbin Institute of Technology (HIT) and then became a Professor of HIT. Besides, he is the Vice-Director of National Engineering Center of Urban Water Resources, a premier water treatment service organization in China. He has published more than 87 papers in reputed journals.

yaojiejiehit@163.com