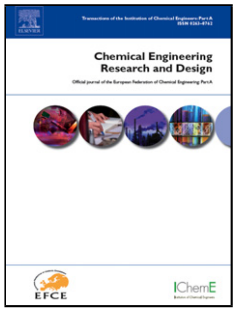

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Effect of CNT content on physicochemical properties and performance of CNT composite polysulfone membranes

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Abstract:

This study was to research the influences of carbon nanotubes (CNTs) on the physicochemical properties and filtration performance of CNT/polymer composite membranes. Two types of CNT embedded polysulfone (PSF) membranes were fabricated by using raw CNTs (rCNTs) and oxidized CNTs (fCNTs), respectively. The leakage of CNTs during the membrane fabrication was observed; the loss of fCNTs in the fCNT membrane (M-fCNT) was more severe than that of rCNTs in the rCNT membrane (M-rCNT). The porosity, surface hydrophilicity, thermal stability and strain stress of the membranes were dependent upon the CNT content. The CNTs composite membranes exhibited typical asymmetric membrane structure including a thin dense top surface and a porous bulk layer with abundant finger-like pores, and the mean pore size of top surfaces increased with the incorporation of CNTs. The overall porosities of M-rCNT and M-fCNT membranes were 54 and 68%, respectively.