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Antifouling, high-flux oil/water separation carbon nanotube membranes by polymer-mediated surface charging and hydrophilization

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Abstract

A facile approach to fabricating the antifouling, high-flux oil/water separation carbon nanotube (CNT) nanohybrid membranes was explored by polymer-mediated surface charging and hydrophilization through vacuum-assisted self-assembly process. The controlled stacking of CNT imparted the membranes hierarchical nanostructure and high water permeation reaching 4592 Lm⁻²h⁻¹bar⁻¹, which was about 10 folds of commercial ultrafiltration membranes used for oil/water separation. Modifying CNT with a series of polymers endowed the membranes with different surface charge and hydrophilicity. The compact hydration layer was formed at the interface of

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