

Preparation of CNT/GONR hybrid membrane from its hydrogel

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Dispersion of neat carbon nanotubes (CNTs) in an aqueous solution was hardly achieved owing to its hydrophobic surface properties. In this work, multi-walled-CNTs (MWCNTs) were partially oxidized in the presence of KMnO_4 and the degree of oxidation was controlled by adjusting the oxidation conditions. At the optimized conditions, the oxidation process can generate oxygen-functional groups on the surface of MWCNTs and some MWCNTs were unzipped to form graphene oxide nanoribbon (GONR). The hybrid materials of CNT/GONR showed enhanced dispersion in an aqueous solvent and formed hydrogel at the concentration of 40 mg/mL. Large-area nanofiltration membranes could be fabricated by coating the CNT/GONR hydrogel with a slot die coater and the membrane can filter several nanoscale dyes with high water flux with excellent stability in harsh conditions.