

Environmental Applications of (Re)active Carbon Nanotube-based Membranes

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Abstract

Carbon nanotube (CNT) networks can serve as the foundation for materials that are both porous and conductive. For example, an electrochemical carbon nanotube filter is observed to be effective and efficient for a range of water treatment applications (e.g., drinking water and industrial & mining wastewater treatment, groundwater remediation) due to synergisms between the hybridized physical-chemical processes. To minimize the potential environmental implications of CNT release from the filter, a porous, conductive, and stable CNT-PVDF composite was developed and is observed to prevent both mechanical and electrochemical degradation of the CNT filter. The non-Faradaic CNT-PVDF membrane has also been observed to be effective and efficient for capacitive reduction of organic ultrafiltration.

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