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**Preparation, Characterizations and Performance Evaluations of Alumina Hollow Fiber Membrane incorporated with UiO-66 particles for Humic Acid Removal**

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**Abstract**

Humic acid removal requires ceramic membranes incorporated with metal organic framework (MOF) to display remarkable stability over water. Recent work has shown UiO-66, a Zr-based MOF, as an emerging material with the potential to fulfill this requirement. This work investigated the preparation, characterization and performance of UiO-66 particles deposited on alumina hollow fiber membranes. Concentrations of Zr precursors and synthesis period were varied in the preparation of UiO-66 using solvothermal synthesis. The presence of UiO-66 particles was characterized using the field emission scanning electron microscopy (FESEM), energy dispersive X-ray spectroscopy (EDX) mapping, x-ray diffraction (XRD) and Brunauer–Emmett–Teller (BET) analysis. Pure water flux and humic acid rejection tests were carried out on both pristine alumina hollow fiber membranes and alumina hollow fiber membranes deposited with UiO-66 particles. In the former, a high pure water flux value of  $231.24 \text{ L m}^{-2} \text{ h}^{-1}$  was recorded, while in the latter the recorded value dropped to  $9.36 \text{ L m}^{-2} \text{ h}^{-1}$ . Pristine ceramic hollow fiber membranes used to separate humic acid ( $1 \text{ g L}^{-1}$ ) from an aqueous solution showed a rejection rate of 98 %. When UiO-66 particles were deposited on

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