

# **Fabrication and characterization of polyphenylsulfone/ tin oxide mixed matrix hollow fiber membranes for Reactive Black-5 dye removal application from wastewater**

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## **Abstract**

The Polyphenylsulfone (PPSU)/ nano tin oxide (SnO<sub>2</sub>) mixed matrix hollow fiber ultrafiltration membranes were fabricated thru dry-wet spinning process via phase separation method. The fabricated HF membranes were employed for the removal of RB-5 dye from wastewater. Various characterization methods were employed to characterize the HF membranes such as, Field Emission Scanning Electron Microscopy (FESEM), Energy Dispersive Spectroscopy (EDS), Atomic Force Microscopy (AFM), water uptake, porosity and contact angle. The permeability ability of membranes was assessed experimentally by measuring water flux (PWF) and fouling behavior was assessed with Bovine Serum Albumin (BSA) protein flux. Cross-flow filtration cell was engaged to conduct the dyes filtration study. Membranes exhibited better outcome results, with the continuous enhancement of SnO<sub>2</sub> nanoparticles in PPSU polymer. In conclusion, PS-3 membrane exhibited high potential towards dyes removal application, of about 94.44 % for RB-5 dye.

**Key words:** Polyphenylsulfone, Tin oxide, Dry-wet spinning, Cross-flow filtration, RB-5 dye.

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