



Preparation and characterization of blended membrane for copper removal application

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ABSTRACT

The current study elaborates the fabrication of the hydrophilic composite membrane (PVDF/PVP) for the removal of heavy metals present at low concentrations in water. The modified hydrophilic poly(vinylidene fluoride) (PVDF) composite membrane was prepared with a % ratio by blending hydrophilic poly(vinylpyrrolidone) (PVP) with hydrophobic PVDF. The Fourier transform infrared analysis reveals an interactive relationship between polymer and additives but fails to affect the crystal polymorphism of PVDF to an appreciable extent. Morphology of the fabricated composite membrane was inspected through scanning electron microscopy, revealing that PVP concentration strongly influences the overall morphology of the fabricated membrane. The low concentration of PVP produced macro-voids while the high concentration produced spongy and spherulitic morphology. Performance of the membrane was measured in terms of heavy metals removal, porosity, and water uptake. The results are suggestive of the fact that this membrane can be employed in real terms for the removal of heavy metals especially copper (Cu^{2+}) from water.

Keywords: Hydrophilic membrane; PVDF; PVP; Heavy metal

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