عنوان مقاله:

Fabrication of Hydrophobic Membrane for the Separation of n-Hexane/Water Mixture Using Novel Oleophilic Nanoparticle and Kevlar Fabric, as a Superior Support

محل انتشار:

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خلاصه مقاله:

The fabrication of functionalized membranes with hydrophobic/oleophilic surfaces for the elimination of n-hexane from water using para-aminobenzoate alumoxane, boehmite-epoxide and a novel nanoparticle, i.e., Stearate Alumoxane by a simple coating technique, is reported here. FTIR was used to characterize nanoparticles. SEM and contact angle measurement analyses were used to identify the nanocomposite membranes. The concentrations of oil in permeate and retentate were measured byUV/vis spectrophotometer. The morphology of Stearate alumoxane nanoparticles was investigated by means of SEM images. The composed film of nanoparticles on the Kevlar fabric was hydrophobic with water contact angle of ~ 145° and oleophilic with oil contact angle of ~ 0º. In addition, the membranes retained stable hydrophobicity and high separation efficiency even after employing for 6 times. Applying these properties, a setup was considered using the functionalized Kevlar fabric to separate oil throughdown to a collector and leave water drops. Our batch filtration system was exclusively gravity-driven. The achieved separation system can separate the oily water mixture (with the concentration of 20 % (v/v) n-hexane in water), effectively with a separation efficiency of 84%.

کلمات کلیدی:

Hydrophobic, Nanomaterials Coating, Nanocomposite Membrane, Kevlar Fabric, Oil/water Emulsion