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Thermodynamic modeling behavior of cellulose acetate/polyvinyl chloride blend membrane preparation

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Thermodynamic behavior of membrane preparation using quaternary system with two low molecular weight components: N-Methyl-2-Pyrrolidone (NMP) as solvent, and Tetrahydrofuran (THF) as co-solvent; and two high molecular weight polymers: Cellulose Acetate (CA) and Polyvinyl Chloride (PVC) was investigated. An extended modified Flory-Huggins model was used as a basis for the model. The model could indicate the miscibility limits of polymers blend solution at room temperature. The diffusion model is used to investigate the immersion/precipitation process. The diffusion model has shown that the solvent/co-solvent volume fraction increased with time in the coagulation bath, while the polymer solution volume fraction decreased owing to solvent/co-solvent removal from polymer solution and membrane formation. The ratio of the volume fraction of the polymer to the solvent/co-solvent in the formed membrane was increasing gradually due to the release of the solvent/co-solvent from the formed membrane to the coagulation bath.

Biography

Ayman El-Gendi is working as an Assistant Professor in Chemical Engineering & Pilot Plant Department, Engineering Research Division at National Research Center, Egypt.

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