عنوان مقاله:

Hydrophobicity Properties of Graphite and Reduced Graphene Oxide of The Polysulfone (PSf) Mixed Matrix Membrane

محل انتشار:

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خلاصه مقاله:

Hydrophobicity properties of graphite and green synthesized graphene (gsG) from exfoliated graphite/GO towards polymer membrane characteristic and properties at different weight percentage concentrations (1, 2, 3, 4 and 5 wt. %) were investigated. PSf/graphite and PSf/gsG membranes were characterized in term of hydrophobicity, surface bonding, surface roughness and porosity. FTIR peaks revealed that membrane with graphite and green synthesized graphene nearly diminished their O-H bonding which was opposite to the graphene oxide peak that show a strong O-H bonding as increased exfoliated time was reported in our previous work. These results were also in line with the contact angle results that showed strong hydrophobicity for the graphite and green synthesized graphene membranes which were then opposed to the exfoliated graphene oxide membrane that has strong affinity towards hydrophilicity properties (as mentioned in previous conducted works). The effect of strong hydrophobicity in modified membrane has result in smoother surface roughness compared to PSf membrane with exfoliated graphene oxide. Results of the surface roughness were in line with the FTIR transition peaks hydrophilicity of exfoliated graphene oxide. It showed that the transition peaks slowly reduced as increasing the formation of green synthesized graphene powder indicating the increment of hydrophobicity properties. The decreased of pure water flux was attributed to the decreased hydrophilicity. From the overall results, it is concluded that the hydrophobicity of PSf/graphite and PSf/green synthesized graphene membrane is not suitable to be applied in water separation whilst be potential for oil and dye separation.

کلمات کلیدی:

Graphite, Green synthesized graphene (gsG), PSF membrane, Hydrophobicity