

عنوان مقاله:

Carbon Dioxide absorption by asymmetric PEI hollow fiber membrane contactor

محل انتشار:

سومین همایش ملی نفت، گاز و پتروشیمی (سال: 1392)

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نویسنده:

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خلاصه مقاله:

Porous asymmetric polyetherimide (PEI) hollow fiber membrane were fabricated via a phase inversion method using methanol (0 and 2 wt.%) as additive in the dope solution. An aqueous solution of 1-methyl-2-pyrrolidone (90 wt.%) was used as bore fluid to prevent forming inner dense skin layer. The effect of the additive on the resulting membrane structure, surface porosity, pore size, critical water entry pressure, collapsing pressure and CO₂ absorption performance by distilled water in a gas-liquid membrane contactor system were investigated. Cloud point diagrams indicated that the precipitation rate of the polymer dope increased by increasing additive concentration in the spinning dope. Results of gas permeation tests showed that methanol with 2 wt.% provided the membranes with the larger pore size. The cross-section of the membranes was examined via a scanning electron microscopy. Methanol (2 wt.%) in the spinning dope provided the membrane structure with a sublayer with finger-like macrovoids, originating from inner and outer surfaces of the hollow fiber and extending to the middle section of the hollow fiber wall, which resulted in a larger pore size and higher CO₂ absorption rate than the other PEI hollow fiber membrane.

کلمات کلیدی:

Polyetherimide, hollow fiber membrane contactor, CO₂ absorption, Glycerol

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