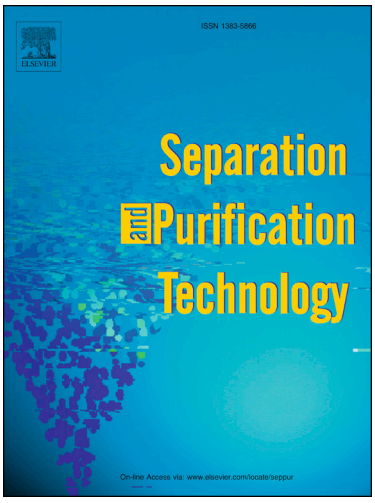

Enhanced CO_2 permeability in Matrimid® 5218 mixed matrix membranes for separating binary CO_2/CH_4 mixtures

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Abstract

Membrane gas separation is an emerging technology used for the separation of CO_2. Matrimid® 5218, one of the current polymers used in membrane gas separation, has good selectivity, but poor CO_2 permeability. We wondered if its CO_2 permeability could be enhanced by the addition of a CO_2-philic additive (PEG 200) and ZIF-8 nanoparticles. ZIF-8 particles were synthesized with a nanoparticle size of 33.83 ± 6.2 nm. These particles were characterized by SEM and XRD. Dense film-casting method was used to prepare novel ternary mixed matrix membranes with low PEG concentrations (4 wt.%) at different filler loadings (10-40 wt.%). In CO_2/CH_4 binary