Mixed matrix membranes based on hyperbranched polyimide and mesoporous silica for gas separation

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ABSTRACT

The novel mixed matrix membranes were prepared from the hyperbranched polyimide based on 4,4´,4´´-triaminotriphenylmethane and mesoporous silica MCM-41 (up to 16 wt.%). The permeability coefficients of hydrogen, carbon dioxide, oxygen, nitrogen and methane in the membranes increased and oxygen/nitrogen or carbon dioxide/methane selectivities decreased slightly with the silica content. The absolute values of permeability coefficients were fairly influenced by the method of additive incorporation to the polymeric matrix.

Keywords: Gas permeation; Mixed matrix membrane; Hyperbranched polyimide; Mesoporous silica; 4,4´,4´´-triaminotriphenylmethane; Oxygen/nitrogen selectivity

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