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Composites of Ionic Liquid and Amine-modified SAPO 34 Improve CO₂ Separation of CO₂-selective Polymer Membranes

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Highlights

- > SAPO 34 was modified with amine groups to improve CO₂/H₂ selectivity of MMM.
- > IL was loaded on modified SAPO 34 to enhance cohesion between SAPO 34 and polymer.
- > MMM surface became smooth after SAPO 34 was modified with NH₂ groups and IL.
- > Both CO₂ permeability and selectivity of MMM increased after the modification.
- > CO₂/H₂ selectivity of MMM with IL/SAPO 34-NH₂ reached up to 22.1 at 20 °C.

Abstract

Mixed matrix membranes with ionic liquids and molecular sieve particles had high CO₂ permeabilities, but CO₂ separation from small gas molecules such as H₂ was dissatisfied because of bad interfacial interaction between ionic liquid and molecular sieve particles. To solve that, amine groups were introduced to modify surface of

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