

Mixed-Matrix Membranes incorporated with dual carriers for high CO Separation Performance

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Carbon Monoxide (CO) separation and recovery from chemical industries have attracted attention and interest around the world due to the necessity of CO as a useful starting material for synthesizing various basic chemicals. We report novel mixed-matrix membranes based on dual carriers for CO separation. Ag⁺ ions and Ag nanoparticles-impregnated MIL-101 (Ag@MIL-101) are used as carriers in the membranes. PGMA-co-POEM; PGO was newly synthesized for this work, in the role of instrumental in connecting Ag⁺ ions with C-O-C group and spreading Ag@MIL-101 in mixed matrix membranes. The 10 wt% Ag@MIL-101 MMMs exhibited the best performance with CO permeance of 30.7 GPU and CO/N₂ selectivity of 11.8. The concept of accelerated transport mechanism paves a way to enhance both permeance and selectivity, which validates the synergistic effect of two different carriers.

Reference

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