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CO₂/N₂ Separation by Supported Ionic Liquid Membranes Based on Tubular Ceramic Support Impregnated with Selected Ionic Liquid

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The separation of CO₂/N₂ by supported ionic liquid membranes (SILMs) is presented. SILMs have been developed through impregnation of the ceramic support nanopores of commercial PDMS (polidimetylosiloxane) membranes (made by Pervatech BV) and commercial microfiltration membranes (made by Inopor) with 1-ethyl-3-methylimidazolium acetate ([Emim][Ac]). Comparison of the separation efficiency of SILMs prepared on the same ceramic supports shows that SILMs based on PDMS membranes show good stability and very high CO₂/N₂ selectivity. The obtained results present an inexpensive alternative in selective CO₂/N₂ separation by SILMs, especially when the choice of selectivity is the first priority. Comparison with Robeson upper bound correlation and literature data shows that applying the ionic liquid and appropriate impregnation method to PDMS membranes results in a significant improvement in separation performance.

Metryczka

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