

Selective polymer-ionic liquids membranes for improved CO₂ transport

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Polymeric membranes have been widely used to separate gas mixtures, such as O₂/N₂, CO₂/CH₄, CO₂/N₂, and olefin/paraffin. The permeation selectivity is the ratio between composition ratio at the permeate side and composition ratio at the feed side. In addition, the permeation selectivity is a product of solubility selectivity and diffusivity selectivity. We present a novel idea and describe its experimental result, which was achieved by preparing polymer gel films that included a room temperature ionic liquid (RTIL) in a polymer matrix. It is known that CO₂ can dissolve easily in imidazolium-based RTILs. We prepared polymer-ionic liquid gel films using an ionic liquid, 1-ethyl-3-methylimidazolium acetate ([emim] acetate, C-tri) and a host polymer, poly (vinyl acetate) (PVA_C, Aldrich).