

The Permeation Properties of CO₂ and CH₄ in Biogas for Organic/Inorganic Hybrid Membranes

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The use of polymeric membranes for CO₂/CH₄ separations has increased for a variety of industrial applications, including enhanced oil recovery, the treatment of landfill gases and the sweetening of natural gases. For the membrane processes to be successful, new polymeric materials with higher permeability and selectivity are required. It is generally known that polymeric membrane that has high gas permeability exhibits low selectivity and vice versa. The objective of this study is development of Poly(ether-block-amide)(PEBA, PEBAX™) based organic-inorganic hybrid membrane materials for enrichment of methane in biogas from various sources and environments such as small landfills, waste water, and animal feedlots, etc. This research on chemical and physical structure of hybrid membranes, their separation properties, mechanical properties as well as optimization of membrane preparation will lead to the development of new membrane materials with outstanding permeation properties. And the effect of molecular structure and interchain packing will be studied in terms of the gas permeability and selectivity.