

论文

Matrimid®5218/PSf双层非对称中空纤维膜的制备及其气体分离性能研究

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摘要:

以商业化聚酰亚胺Matrimid®5218作为功能层材料, 聚砜作为支撑层材料, 采用共挤出法制备双层非对称中空纤维气体分离膜。所制备的双层非对称中空纤维膜具有致密无缺陷的超薄皮层, 致密皮层厚度约为0.21 μm。在25 °C, 0.5 MPa下, CO₂/CH₄的选择性系数达51.39, CO₂的渗透系数为46.29 GPU, O₂/N₂的选择性系数达到7.13, O₂的渗透速率为6.38 GPU。考察了温度和压力对膜的渗透系数和选择性系数的影响, 并考察了物理老化对膜性能的影响。

关键词: 超薄致密无缺陷皮层 双层非对称中空纤维膜 气体分离

Fabrication of Dual-layer Matrimid®/PSf Hollow Fiber Membrane and Its Gas Separation Performance

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Abstract:

Dual-layer Matrimid®/PSf hollow fiber membranes for gas separation were fabricated *via* co-extrusion technology. The hollow fiber membranes have an ultrathin dense-selective layer of 0.21 μm. The hollow fiber membranes have a CO₂ permeance of 46.29 GPU with a CO₂/CH₄ selectivity coefficient of 51.39 at 25 °C and 0.5 MPa. And the hollow fiber membranes have an O₂ permeance rate of 6.38 GPU with an O₂/N₂ selectivity coefficient of 7.13 at 25 °C and 0.5 MPa. The effects of the test temperature and the feed pressure on the gas separation performance were investigated. Finally, the aging phenomena were investigated.

Keywords: Ultrathin dense-selective layer Dual-layer hollow fiber membranes Gas separation

收稿日期 2008-04-08 修回日期 1900-01-01 网络版发布日期

DOI:

基金项目:

通讯作者: 曹义鸣

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