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FULL PAPERS

在多孔γ-Al_2O_3氧化铝载体上微波合成NaA分子筛膜及气体渗透分离性能

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摘要 本文介绍了一种新的微波合成高性能NaA分子筛膜的方法。合成方法分两步，首先在多孔γ-Al_2O_3氧化铝载体上预涂纳米尺寸的晶种，然后在微波加热条件下进行水热合成。考察了吸附晶种次数、合成时间和合成次数对分子筛膜的影响。分别用单组份气体(H_2, N_2)和混合组份气体(H_2/N_2)进行膜质量的评价。结果显示三次合成后的分子筛膜的气体理想分离选择性从载体的1.90增加到6.37，明显高于努森扩散选择性3.74。然而，混合气体H_2/N_2的分离选择性则接近于努森扩散选择性，但显著低于理想选择性。

关键词 NaA分子筛膜, 气体分离,微波加热

分类号

Microwave-heating Synthesis and Gas Separation Performance of NaA Zeolite Membrane

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Abstract The paper presented novel synthesis of NaA zeolite membrane with good performance using microwave heating. The method involved two steps, prior seeding 120 nm of LTA crystals on substrate and then employing a secondary hydrothermal synthesis. Effects of seeding times, synthesis time and synthesis times were investigated in this work. The quality evaluation of membranes respectively used single component gases (H_2 and N_2) and H_2/N_2 (equivalent volume)mixture. The ideal H_2/N_2 selectivity increased from 1.90 of the substrate to 6.37 of the three-stage synthesized membrane, which was distinctly higher than the corresponding Knudsen diffusion selectivity of 3.74. However, the real H_2/N_2 selectivity of the three-stage synthesis was much lower than the corresponding ideal selectivity and close to the corresponding Knudsen diffusion selectivity of 3.74.

Key words NaA zeolite membrane gas separation microwave heating

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