

Optimization of Hydrothermal Synthesis Condition to achieve High Phase Purity, N₂/CH₄
selective SAPO-34 membrane

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Silicoaluminophosphate (SAPO-34) zeolite membranes having pore diameter of 0.38nm, have shown excellent gas separation performance for light gases like CO₂, N₂ and CH₄. In this study SAPO-34 membranes were synthesized using various synthesis conditions. Three types of gel compositions with similar number of different seeds were used for the synthesis of membrane on alumina support (100nm pore size) by dip coating method in various temperature conditions. The membranes were analyzed using SEM and XRD for the morphology characterization and gas properties were tested using a homemade single gas testing apparatus. The crystallinity was abruptly improved by the addition of Dipropyl amine as an additional structure directing agent (SDA) and also the membrane show nitrogen selectivity in response. Nitrogen selective membranes show a high gas permeance (above 2000 GPU); however the selectivity of these membranes was low (max 2.25). The membranes synthesized using the rub coating for comparison was found to have lower gas performance.