

A study of nitrogen adsorption property from ammonia reforming gas using zeolite 5A

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Production of hydrogen is becoming increasingly important nowadays. Hydrogen can be produced from different feed stocks, such as fossil resources (natural gas, oil refinery fractions and coal). In this study, we used the reforming of ammonia that was decomposed into nitrogen and hydrogen. Adsorption experiment was performed in a fixed bed reactor with flow rate of 100mL/min using zeolite 5A. The outlet gases from the reactor were analyzed automatically using a thermal conductivity detector (TCD). The nitrogen adsorption property was carried out at various temperature and pressure. Zeolite 5A showed the nitrogen adsorption capacity of 0.593 mmol N₂/g sorbent at 0°C and 10atm. The concentration of hydrogen in the outlet gas could reach as high as 99.5%. The breakthrough time increased with increase pressure while it decreased with increase temperature. The adsorption of nitrogen in zeolite 5A was strongly dependent on pressure and temperature.