

Adsorption Properties in CO₂ Recovery Process using Surface Modified Mesoporous Adsorbents

황경준, 백일현¹, 박예원¹, 김선일, 이재욱*
조선대학교; ¹한국에너지기술연구원
(jwlee@chosun.ac.kr*)

Polyethyleneimine (PEI) modified mesoporous silicate MCM-41 (MCM-41-PEI), MCM-48 (MCM-48-PEI) and SBA-15 (SBA-15-PEI) was prepared by a wet impregnation method for the adsorption of CO₂. The samples were characterized by XRD, FT-IR, TEM, and nitrogen adsorption/desorption isotherms. It was found that the PEI was uniformly dispersed into the channels of the molecular sieve MCM-41, MCM-48 and SBA-15. The adsorption uptake was measured at (343.15, 353.15, 363.15 and 373.15) K using thermogravimetric analysis. The adsorption capacity of MCM-41-PEI was significantly greater than that of MCM-41. In the addition, The surface modified mesoporous materials obtained in this work can be successfully applied for the many industrial fields such as memory media, sensor, catalysts, membrane, gas storage and supports. In addition, it was found that the integral adsorption isotherm model was highly useful for the design, modification and surface heterogeneity analysis of mesoporous materials for CO₂ adsorption.