

XRD and CO₂ adsorption studies of modified silica gel with octadecylamine

ABSTRACT

Porous surface of silica gel (SG) have been modified with long and straight chain fatty amine compounds (octadecylamine, ODA) via wet impregnation process. Initially, heat treatment with various temperature which are 100 °C, 200 °C, 400 °C and 600 °C was done to the SG before continuing with impregnation process. Characterizations by XRD of the treated samples were showed no significant difference in each diffractogram. The best temperature for heat treatment was 600 °C (SG600) and it was referred to the ability of the SG600 type adsorbents in adsorbing CO₂ resulted from adsorption desorption isotherm of CO₂. The 5 and 35 wt% of ODA supported on the SG600 was further characterized using XRD analysis which displayed the increasing intensity of crystalline ODA with higher percent amine loaded and shifting of the several crystalline peaks of ODA verified the interaction of SG600-ODA. These further strengthen the dispersion of ODA on the surface of SG600.

Keyword: CO₂ capture; Modified silica gel; Octadecylamine impregnation