

## Preparation and characterization of aminopropyl-functionalized mesoporous silica MCM-48 for CO<sub>2</sub> capture

고용식\*, 장현태<sup>1</sup>, 박윤국<sup>2</sup>  
신성대학; <sup>1</sup>한서대학교; <sup>2</sup>홍익대학교  
(ysko@shinsung.ac.kr\*)

In an effort to develop effective adsorbents for CO<sub>2</sub> capture, we prepared two different types of aminopropyl-functionalized mesoporous silica MCM-48 materials. Physicochemical information of the functionalized MCM-48 materials was obtained by X-ray powder diffraction (XRD), transmission electron microscopy (TEM), Fourier transform infrared spectroscopy (FT-IR), N<sub>2</sub> adsorption/desorption, thermal gravimetric analysis (TGA) as well as CO<sub>2</sub> adsorption/desorption performance. The N<sub>2</sub> adsorption-desorption analysis showed a considerable decrease of the pore volume and surface area for the aminopropyl-functionalized mesoporous silica MCM-48 samples. The CO<sub>2</sub> adsorption properties of the aminopropyl-attached MCM-48 samples were studied using a gravimetric technique based on a microelectronic balance system. The results showed that these materials exhibited high CO<sub>2</sub> adsorption capacities. The coating method was found to be a better method for the preparation of aminopropyl-functionalized MCM-48 adsorbents than grafting method.