Ordered Mesoporous Magnesia-Alumina Adsorbents for Post-Combustion CO_2 Capture

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A set of ordered mesoporous magnesia-alumina adsorbents with different molar ratio was synthesized by the single-step evaporation-induced self-assembly method for CO2 capture into MgCO3. The adsorbents were characterized by BET, XRD, TEM, CO2-TPD, and CO2-TGA. Among the adsorbents tested, magnesia-alumina with Mg/Al molar ratio of 0.5 shows the best CO2 adsorptive performance at 25 0C. Moreover, magnesium oxide confined in the mesoporous channel of the alumina exhibited a strong resistance toward aggregation during the cyclic adsorption-desorption. This work was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (Grant number: NRF-2013R1A1A2060638).