

The preparation and characterization of amine-modified silica gel adsorbent from the sodium silicate through one-pot process

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(kimsh@korea.ac.kr^{*})

In this research, amine-modified silica gel adsorbent was prepared for the carbon dioxide adsorption. The source of silica gel was the sodium silicate and the gel was prepared by one-pot process. In the one-pot process, the formation of silica gel and the amine grafting reaction was simultaneously performed. The sodium silicate solution was pretreated by the ion exchange resin and poured into the mixture of amino silane compound, surfactant, and ammonium hydroxide. After the 12 hr reaction, the amine-modified silica gel was washed by DI water and dried at 80 °C in ambient pressure. The silica gel was characterized XRD, IR, and BET analysis and the capacity of carbon dioxide adsorption was measured by TGA.