

Study on CO<sub>2</sub> desorption behavior of amine-functionalized silica for CO<sub>2</sub> capture

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Amine-silica adsorbent which is a part of the array of hybrid organic-inorganic dry sorbent for CO<sub>2</sub> capture is one of the emerging technologies of Carbon Capture and Sequestration (CCS) to mitigate climate change. Development of this type of sorbent and design of process condition tend to be very critical as several issues arise upon realization of its large-scale implementation. Since one of the desirable characteristics of a CO<sub>2</sub> sorbent is long term stability under a range of practical operating condition, study of CO<sub>2</sub> desorption behaviors can be beneficial in the selection of the desorption condition upon implementation of these sorbents in commercial capturing process. In this study, desorption behavior of amine-functionalized silica sorbents prepared through incipient wetness technique with primary, secondary and di-amino organosilanes were investigated using Thermogravimetric analysis (TGA) and Temperature Programmed Desorption (TPD). Furthermore, in-situ IR was used to evaluate adsorbed and desorbed species formed at different temperature.