

## Structured Amine Functionalized Silica Adsorbents for Efficient CO<sub>2</sub> Recycling

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In this work, linker added double-functionalized amine adsorbents were fabricated exhibiting the improved performance in regeneration process. Linkers having the functional groups such as carboxylic acid or sulfonic acid were introduced with amines into aminosilane-grafted solid adsorbents. Acid-base interaction between the linkers and the amines is expected to improve the thermal stability by linking amines and faster the desorption rate by lowering CO<sub>2</sub> binding energy of the amines.

The interaction between the chemical linkers and the amines is confirmed from IR spectra analysis of chemical linker-amine mixture and as-prepared adsorbents. As-prepared adsorbent showed the improvement in the thermal stability from the thermogravimetric analysis. The structural characteristics were also investigated on the adsorbents, and repetitive adsorption-desorption cyclic test in fixed-bed reactor were performed.