

### Regenerable Sodium-Based Sorbents for CO<sub>2</sub> Capture at Middle Temperatures

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A novel sodium-based sorbent (NZA85) was developed for CO<sub>2</sub> capture at middle temperature range between 200 and 400°C. The CO<sub>2</sub> capture and regeneration properties of sodium-based sorbents were measured in a fixed bed reactor at the temperature conditions (CO<sub>2</sub> capture at 200°C and regeneration at 400°C) at 1 atm. The sorbent was prepared by the physical mixing of sodium carbonate with zirconium oxide. The NZA85 sorbent showed an excellent CO<sub>2</sub> capture capacity of about 100 mg CO<sub>2</sub>/g sorbent at the first cycle. However, the CO<sub>2</sub> capture capacity of the sorbent was decreased to about 40 mg CO<sub>2</sub> /g sorbent at the second cycle. After 2 cycles, the CO<sub>2</sub> capture capacity was maintained during he multiple tests. The excellent CO<sub>2</sub> capture capacity of sodium-based sorbent was due to the structure effect of active alloy material formed during the preparation of the sorbent. These results were discussed through the analysis of XRD patterns.