

Effect of morphological differences of various CaO-based sorbents on CO<sub>2</sub> sorption

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The CO<sub>2</sub> sorption properties of the CaO-based were investigated at various CO<sub>2</sub> concentrations and temperatures. The CaO-based sorbents were prepared by calcining various precursors such as calcium carbonate (cCaO), calcium acetate (aCaO) and calcium oxide (nCaO, Alrich) at 850°C. The CO<sub>2</sub> capture capacity increases with increasing CO<sub>2</sub> concentration in the range 0.5 - 20 vol.%. Also, the CO<sub>2</sub> capture capacity increased as the temperature was increased from 500 to 700 °C. To investigate the morphological differences of CaO-based sorbents, CaO-based sorbents were characterized by BET (Brunauer-Emmett-Teller). The pore volume and pore diameter of the CaO-based sorbents were followed by: cCaO > aCaO > nCaO. From these results, it was concluded that pore volume and pore diameter of the sorbent plays on important role in the CO<sub>2</sub> capture capacity due to the effect of CO<sub>2</sub> diffusion. The morphological differences of CaO-based sorbents were discussed and characterized by XRD, TG and SEM.