

Absorption and regeneration properties of sodium-based MgO sorbents for carbon dioxide capture

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The sodium-based MgO sorbents were prepared by the impregnation of magnesium oxide (MgO) with sodium carbonate (Na_2CO_3). The sodium-based MgO sorbents were calcined in a furnace under a N_2 flow (100ml/min) for 5 h at 300°C, 500°C and 600°C. The CO_2 absorption and regeneration properties of the MgO-based sorbents were investigated in a fixed bed reactor at various temperatures and H_2O concentration conditions. The total CO_2 capture capacities of the sodium-based MgO sorbents (NaMg-500 and NaMg-600), which were calcined at 500°C and 600°C, were 244.6 and 150.6 mg CO_2 /g sorbent, respectively, in the presence of 12 vol% H_2O at 50°C. The physical properties of the sorbents before and after CO_2 absorption were investigated by XRD, TG and TPD.