

Fly Ash Derived Sorbents for CO₂ Capture

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ABSTRACT

This work focuses on the development of fly ash derived sorbents to capture CO₂ from power plant flue gas emissions. The fly ash derived sorbents proposed represent an affordable alternative to existing methods using specialized activated carbons and molecular sieves, that tend to be very expensive and hinder the viability of the CO₂ sorption process due to economic constraints. Fly ash derived sorbents were demineralized and surface oxidized prior to activation to modify the porous structure of the resultant activated carbons towards CO₂ capture. The microporous activated fly ash sorbents with surface area as high as 1139 m²/g have a CO₂ capacity of ~23 mgCO₂/g sorbent at 75°C. Amine impregnation was also used to improve the CO₂ capacity of the activated samples, resulting in capacities as high as 93.6 mgCO₂/g sorbent at 75°C. The CO₂ adsorption capacities of selected activated fly ash carbons were compared to commercial activated carbons.

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