Showcasing research from Professor Zuotai Zhang's laboratory, School of Environmental Science and Engineering, Southern University of Science and Technology, Shenzhen, China.

Efficient and stable CO_2 capture using a scalable and spontaneous cross-linking amine-functionalized nano-Al_2O_3 adsorbent

CO_2 capture performance of polyethyleneimine-functionalized nano-Al_2O_3 adsorbent is demonstrated. Nano-Al_2O_3 spontaneously cross-links amine groups via Lewis acid sites, and the dehydration reaction of primary amines with CO_2 to form isocyanate is prevented. Thereby the adsorbent exhibits excellent overall performance, including high CO_2 uptake (195 mg·g^{-1}), fast adsorption kinetics, consistently stable anti-urea cyclic performance (with a mere 0.14% deactivation per cycle), environmentally friendly and scalable production, and competitive cumulative CO_2 capacity.

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