

## A Study of CO<sub>2</sub> Chemisorption Equilibrium and Kinetic Modeling for Dry Sorbents

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Various kinds of solid sorbents for CO<sub>2</sub> capture have been studied for their low regeneration energy compared to aqueous amine-based sorbents. Capture process of dry sorbents can be categorized into two types. One is physisorption which physically captures CO<sub>2</sub> on sorbent surfaces and the other is chemisorption which chemically reacts with CO<sub>2</sub> while absorbing the CO<sub>2</sub>. Chemisorption of dry sorbents, however, can not be considered to capture CO<sub>2</sub> entirely by chemical reaction. So sorbents which fall into chemisorption criterion also partially possess characteristic of physisorption. As a result, when describing the equilibrium and kinetics of chemisorbing sorbents, a model including attributes of both criteria is needed. To construct the model, experiments at various temperatures using gases of different CO<sub>2</sub> partial pressure were conducted. Experimental results were fitted into predicted model and parameters of the model were obtained. After analyzing the results, the model was modified to better describe the capture process of sorbents. Through the model, equilibrium and kinetic behavior of sorbents at wide range of temperature and CO<sub>2</sub> concentration could be described.