# Equilibrium and kinetic model for $CO_2$ adsorption on amine functionalized sorbent

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Amine functionalized sorbents are considered to be a promising solution to dry CO2 capture process. Many kinds of amine functionalized sorbents are being studied but before those are put into real process, their performances need to be evaluated. The evaluation is done mainly by comparing their capacity and adsorption rate. To measure those properties, research for the equilibrium and kinetic model of the sorbent was conducted. TGA and Autochem experiments were conducted and each data was used to fit equilibrium and kinetic model respectively. Equilibrium model was developed based on Langmuir isotherm and few parameters were estimated including equilibrium constant. These parameters were then applied to kinetic model which takes both forward and backward reaction into account. Kinetic model parameter estimation was done by solving mass balance of packed bed reactor (Autochem) and method of characteristics was used to solve the equations.