

Cation effect of zeolite CHA on CO₂ adsorption isotherm

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Recently, zeolite has drawn much attention because of exceptional CO₂ adsorption capacity. SSZ-13, high siliceous CHA type zeolite analog has been reported to show unusual CO₂ adsorption capacity. Further aluminosilicate CHA zeolite of low Si/Al ~ 2.3 showed much stronger CO₂ adsorption more than on SSZ-13 that the corresponding CO₂ adsorption isotherm was belong to the type I Langmuir isotherm. However, for reversible carbon dioxide storage, the adsorbed CO₂ onto zeolite has to be removed with a little energy consumption. In the present work, we have investigated the effect of the cation exchange into zeolite on the adsorption isotherm using dual site adsorption model for the analysis of CO₂ adsorption isotherm as a function of temperature. The result showed that the resulting isotherm after the ion exchange contained both strong and weak adsorption characteristics depending on the exchanged cation and the portion of the weak adsorption could be increased with simple ion exchange.