Geophysical Research Abstracts
Vol. 14, EGU2012-4036-1, 2012
EGU General Assembly 2012

A Study of Adsorptive Characteristics of Australian Coals

Y. P. Lan and L. L. Tsai
National Central University, Province Of China Taiwan (s102819@gmail.com)

Ever since the Kyoto Protocol, controlling carbon dioxide emission and reducing its content in atmosphere are very important environmental issues up to today. One of the effective methods for permanent sequestration of anthropogenic CO_2 is to inject CO_2 into deep, unminable coal seams and recover coal bed methane at the same time. CO_2-ECBM technology had been proved to be very promising to meet the needs of both environment and energy. Beside other external environment factors, capacity of CO_2 adsorption and CH4 desorption are the most influencing factors in selection of sites for the geological storage of CO_2. Therefore, the objective of this study is to understand the relationship between gas adsorption and CO_2 sequestration, by various experiments for the characterization of Australian of coals. Generally speaking, coal seam gas comprises mostly of CH4, CO_2, C2H6, and N2. However, some of the Australian coals were reported with significant amount of CO_2 up to 90%, which might strongly affect their capacity of CO_2 capture and storage (CCS). High to medium volatile bituminous coals from Sydney Basin and Bowen Basin, southeast Australia were selected in this study. Experiments include maceral composition and vitrinite reflectance measurements, petrographic analysis, Proximate analysis, Ultimate analysis, specific surface area analysis as well as CO_2 and CH4 adsorption experiments were performed. Parameters for difference adsorption functions (Langmuir, BET, D-R and D-A) were then calculated to fit their adsorption isotherms the best fitting curve can then be found. Among these adsorption functions, Langmuir is the most basic and commonly used function theory. The results of all experiments were synthesized to discuss the relations among each other, so as to establish the relationship between gas adsorption and coal characteristics.