

### High pressure adsorption behavior of methane and carbon dioxide mixture on coal

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The methane recovery, which is called to ECBM (Enhanced Coalbed Methane), process can be accelerated by injecting high pressure carbon dioxide into coal bed since two gases competitively adsorbed on coals. To design the process and to understand the adsorption behaviors, the adsorption isotherms of methane and carbon dioxide mixture on coal (Kyungdong coal, South Korea) were measured under supercritical conditions by using a volumetric method coupled with gas chromatographic analysis.

The adsorption was measured at 318.15 K and 338.15 K in the range from 0 to 120 atm on dry and wetted coals, respectively. The feed gas composition was around 80 mol% carbon dioxide in each case. Compared to dry coal adsorption, adsorption on wetted coal showed a lower capacity over experimental pressure range. As expected, mixture adsorption confirmed obviously that carbon dioxide was preferentially adsorbed on coal. These results presented the feasibility of ECBM process.