

Hydrate Equilibrium Conditions for Carbon Dioxide, Water in the Presence of Inhibitors

이두호, 노원구, 이철수, 강정원†
고려대학교
(jwkang@korea.ac.kr†)

In carbon dioxide capture and sequestration process, hydrate phase equilibrium data for carbon dioxide containing thermodynamic inhibitors such as methanol, ethylene glycol is important. Thermodynamic inhibitors suppress the formation of gas hydrate in water-containing mixtures. Researchers have reported hydrate phase equilibrium data containing temperature, pressure, composition of aqueous solution, but they usually have not specified loading composition of carbon dioxide. In the present study, hydrate equilibrium conditions for carbon dioxide, water, inhibitors were measured and the effect of relative amount of carbon dioxide to that of aqueous solution was also studied. Dissociation temperature of gas hydrate was measured by using indirect method. According to Duhem's theorem, dissociation temperature is determined at constant pressure in the equilibrium state of a closed system of fixed composition. It was found that dissociation temperature decreases as the loading fraction of carbon dioxide increases. It indicates that inhibition effect decreases as the loading fraction of carbon dioxide increases.