

Effects of thermodynamic promoters on the phase equilibrium of flue gas hydrates

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CO₂ hydrates have relatively mild formation condition, and CO₂ separation technology using the gas hydrate from flue gas was proposed by Kang et al.[1] They reported phase equilibrium conditions of CO₂ and N₂ mixed gases with THF (tetrahydrofuran) which is one of the most well-known thermodynamic promoters. In this study, we reported the phase equilibrium conditions of mixed gases which have real composition of the blast furnace gas (real BFG), model blast furnace gas (model BFG) and model FINEX off gas (model FOG). We used three types of thermodynamic promoters such as THF, propylene oxide and 1, 4-dioxane. Operating pressure ranges from 0.8 to 5.5 MPa and temperature ranges from 274 to 290 K. Each promoter was used at three different concentrations like 1, 3 and 5.6 mol%. The phase equilibrium measurements were carried out by “continuous” QCM method which was reported efficient and as accurate as the conventional temperature search method by Lee et al.[2]

[1] *Environ. Sci. Technol.* **2000**, *34*, 4397

[2] *Energy Fuels* **2012**, *26*, 767