



## Phase equilibrium measurements for hydrates of the CH<sub>4</sub> /CO<sub>2</sub> / 1, 4-Dioxane aqueous solution system

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### **Abstract:**

The equilibrium compositions and properties of CO<sub>2</sub>/CH<sub>4</sub>/1,4-dioxane/water hydrate were studied for the first time at temperatures ranging from 273.65 to 281.35K and pressures ranging from 0.5 to 1.1MPa. The gas mixture consist of about 45% CO<sub>2</sub> was used to be an exemplary for biogas and landfill gas operations. Equilibrium hydrate formation conditions for above system were measured. 1,4-Dioxane lowered equilibrium pressure by 2MPa comparing with pure water at some temperatures. This is an indication that structural transition from SI to SII was occurred.

**Keywords:** Equilibrium, Carbon dioxide, Methane, 1,4-Dioxane, Separation, Hydrate, Promoter.

### **Research Highlights**

- equilibrium compositions and properties of CO<sub>2</sub>/CH<sub>4</sub>/1,4-dioxane/water hydrate were studied
- 1,4-Dioxane lowered equilibrium pressure by 2MPa comparing with pure water
- The gas mixture consist of about 45% CO<sub>2</sub> was used