Experimental and Modeling Investigation on Structure H Hydrate Formation Kinetics

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Abstract

In the current work, the kinetics of crystal H hydrate formation is modeled by using the chemical affinity model. The experiments were performed at constant temperatures of 274.15, 275.15, 275.65, 276.15 and 277.15 K. Methylcyclopentane (MCP) is used as sH former and methane is used as a help gas. The parameters of model (A_r and t_K) are determined and the results show that the parameter of A_r/RT has a constant value at the first step and a different value at second step. These parameters were used to predicting experimental data. The results indicate that this model can predict experimental data very well at several conditions.

Keywords: Chemical affinity; Crystal H; Methylcyclopentane; Formation kinetics; Gas hydrate

Research Highlights

The kinetics study of sH with MCP (for the first time)
Kinetic modeling of structure H with MCP
Using the thermodynamic driving force for kinetic modeling