

Enhanced kinetics of HCFC141b hydrate formation in static conditions using organic phase change material and surfactant

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Abstract

Hydrophobic phase change material and surfactant are investigated as promoters for hydrate formation. Hydrophobic phase change material is the mixture of n-decanoic acid (CA) and dodecyl alcohol (DE), and surfactant is Tween80. Visual observations of the effect of CA-DE and Tween80 on hydrate crystal growth are conducted. Along the direction of crystal growth, HCFC141b hydrate growth rates with additives of CA-DE or CA-DE + Tween80 is almost the same everywhere, while the hydrate crystal growth rates with additive of Tween80 is different at different sites. The average rate of hydrate lateral growth with 1 wt% CA-DE is lower than that with 1 wt% CA-DE and 1 wt% Tween80. Scattered hydrate crystal plates are observed with the addition of CA-DE. However, only one big crystal plate was observed with the addition of Tween80 or CA-DE + Tween80.

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