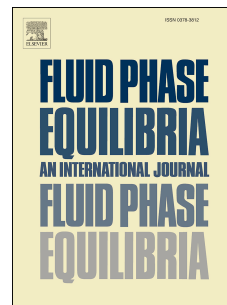


Accepted Manuscript

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PII: S0378-3812(18)30283-8

DOI: [10.1016/j.fluid.2018.07.019](https://doi.org/10.1016/j.fluid.2018.07.019)

Reference: FLUID 11896

To appear in: *Fluid Phase Equilibria*

Received Date: 25 April 2018

Revised Date: 13 July 2018

Accepted Date: 18 July 2018

Please cite this article as: Q. Sun, B. Chen, Y. Li, Z. Xu, X. Guo, X. Li, W. Lan, L. Yang, Promotion effects of mung starch on methane hydrate formation equilibria/rate and gas storage capacity, *Fluid Phase Equilibria* (2018), doi: 10.1016/j.fluid.2018.07.019.

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Promotion effects of mung starch on methane hydrate formation equilibria/rate and gas storage capacity

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ABSTRACT:

The effects of mung starch on methane hydrate formation equilibria/rate and gas storage capacity were investigated in this work. Mung starch at three concentrations of 100, 500, and 800 ppm were tested comparing with the pure water. The results show that mung starch has slight thermodynamic promotion effect on methane hydrate formation, because it decreases the gas-liquid-hydrate three-phase equilibria pressure at the same temperature. The formation rate and gas storage capacity of methane hydrate in the presence of mung starch were studied at 8.0 MPa and 275.15 K ~ 281.15 K. The results demonstrate that mung starch significantly accelerates methane hydrate formation rate. It could shorten the induction time and reaction time of methane hydration process. In addition, the gas storage capacity of methane hydrate is also increased greatly. The solubility data of methane indicate that mung starch indeed plays a role of solubility enhancement. The green and environmental friendly characteristics of mung starch could be helpful to promote the application of hydrate-based technology.

Keywords: mung starch; methane hydrate; formation equilibria; formation rate; gas storage capacity

1. Introduction

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