

Accepted Manuscript

Hydrate Phase Equilibrium Data of Mixed Methane-Tetrahydrofuran Hydrates in Saline Water

Asheesh Kumar, Sharanya Sharma Vedula, Rajnish Kumar, Praveen Linga

PII: S0021-9614(17)30146-5
DOI: <http://dx.doi.org/10.1016/j.jct.2017.05.014>
Reference: YJCHT 5068

To appear in: *J. Chem. Thermodynamics*

Received Date: 23 January 2017
Revised Date: 8 May 2017
Accepted Date: 9 May 2017

Please cite this article as: A. Kumar, S.S. Vedula, R. Kumar, P. Linga, Hydrate Phase Equilibrium Data of Mixed Methane-Tetrahydrofuran Hydrates in Saline Water, *J. Chem. Thermodynamics* (2017), doi: <http://dx.doi.org/10.1016/j.jct.2017.05.014>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Hydrate Phase Equilibrium Data of Mixed Methane-Tetrahydrofuran Hydrates in Saline Water

Asheesh Kumar^a, Sharanya Sharma Vedula^a, Rajnish Kumar^b and Praveen Linga^{a*}

^aDepartment of Chemical and Biomolecular Engineering, National University of Singapore, Singapore 117 585, Singapore

^bDepartment of Chemical Engineering, Indian Institute of Technology Madras, India

Abstract

Solidified natural gas (SNG) technology through clathrate hydrates formation has been considered a viable opportunity for large scale stationary methane/NG storage application. In this direction, the current study reports thermodynamic data on mixed methane (CH₄)-tetrahydrofuran (THF) hydrates in pure water and in saline water. Hydrate phase equilibrium of mixed CH₄-THF hydrates in presence/absence of NaCl (3.0 wt% or 0.87 mol%) were determined employing a high-pressure micro-differential scanning calorimeter. The stoichiometric amount of THF (5.56 mol%) was used in all the experiments which shifts the hydrate phase equilibrium conditions toward milder region (lower pressure and high temperature). We report that the presence of 0.87 mol% NaCl has no significant effect on the equilibrium conditions of mixed CH₄-THF hydrates at low pressure (<1.2 MPa) for a temperature range of 285.9 to 290.5K, however more deviation in equilibrium curves occurs at higher pressure (>2.0 MPa). Clausius–Clapeyron plot for the experimental results was employed to calculate the enthalpy of hydrate dissociation. The enthalpy of dissociation of the mixed CH₄-THF hydrates in presence of 0.87 mol% NaCl was found to be in the range of 150-170 kJ/mol of gas.

Keywords: Gas hydrates, Calorimetry, Phase Equilibrium, Mixed hydrates, tetrahydrofuran, sII hydrates

*Corresponding author: email: Praveen.Linga@nus.edu.sg (P. Linga)

Download English Version:

<https://daneshyari.com/en/article/6659884>

Download Persian Version:

<https://daneshyari.com/article/6659884>

[Daneshyari.com](https://daneshyari.com)