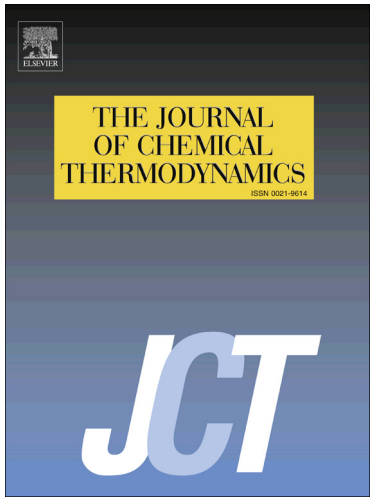

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Prediction of vapor-liquid-hydrate equilibrium conditions for single and mixed guest hydrates with the SAFT-VR Mie EOS

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Abstract

In this work, a thermodynamic modeling approach is utilized to predict the formation conditions of natural gas hydrates. Our approach uses van der Waals-Platteeuw (vdWP) model for the hydrate phase and the SAFT-VR Mie equation of state (EOS) for the vapor and liquid phases. We employ three different association schemes into the SAFT-VR Mie EOS to account for hydrogen bonds among water molecules using square-well (SW), Lennard-Jones (LJ) and Mie potentials. The SAFT-VR Mie EOS is used to determine the solubility of hydrate formers in liquid water. We study single and mixed guest hydrates and compare the results with experimental data. The comparisons with experimental data show that our model gives excellent to satisfactory predictions of the dissociation pressures for single and mixed guest hydrates without re-adjustment of the Langmuir constants.

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