Measurement for the Dissociation Conditions of Methane Hydrate in the Presence of Additives

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ABSTRACT

This study measured the dissociation conditions for methane hydrates in the presence of additives. The hydrate phase dissociation conditions were investigated using an apparatus operated at high pressure and low temperature conditions. The liquid water-hydrate-vapor (Lw-H-V) three-phase equilibrium dissociation temperatures and pressures for methane hydrate in the presence of additives were determined by employing the isochoric method. New experimental data were reported within the pressure range from 6 to 12 MPa for methane + water + isopropylamine hydrate system, and from 7 to 11 MPa for methane + water + 2,5-dimethoxytetrahydrofuran hydrate system, respectively. It is demonstrated that the addition of isopropylamine had a promotion effect on the formation of methane hydrate. On the other hand, the results of adding 2,5-dimethoxytetrahydrofuran showed the inhibition effect on the formation of methane hydrate.

Keywords: methane hydrates, additives, dissociation condition