Methane Hydrate Phase Equilibria and Formation Behaviors in the Presence of Ethylene Glycol and Salts
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In this study, phase equilibrium conditions and formation behaviors of methane hydrate with mono-ethylene glycol (MEG) and salts such as sodium chloride (NaCl), sodium bromide (NaBr), sodium iodide (NaI), were investigated. Thermodynamic conditions of methane hydrate containing MEG and salts were measured with a temperature range of 272 - 283 K and a pressure range of 3.5 - 11 MPa. We can confirm the hydrate inhibition performance in the presence of additives, and can summarize the order as follows: methane hydrate in the presence of (5 wt% NaCl + 10 wt% MEG) > (5 wt% NaBr + 10 wt% MEG) > (5 wt% NaI + 10 wt% MEG). Formation behaviors of methane hydrate with MEG and salts were investigated by analyzing the induction time, gas consumption and growth rate of methane hydrate. There were no significant changes in the induction time during methane hydrate formation, but the addition of MEG and salts solution during hydrate formation can affect the gas consumption and growth rate.

References

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