

Phase Equilibrium, X-ray Diffraction, and Raman Spectroscopic Studies of SF₆ hydrate in the Presence of NaCl

서영록, 이창호, 박정우, 윤지호*, 김병수

한국해양대학교

(jhyoon@kmou.ac.kr*)

Although many studies have been flourished on desalination via hydrate formation, for its potential application knowledge pertaining to the thermodynamic stability, occupation behavior of NaCl hydrate is needed. Herein, phase equilibria of SF₆ + NaCl solutions (0, 2, 4 and 10 wt%) were monitored in the temperature range 277.6 to 285.7 K and under pressures of up to 1.32 MPa. In addition, structural identification of hydrates formed by varying the weight fraction of NaCl relative to water was performed by both Raman spectrometer and X-ray diffraction. Evaluation of the temperature-induced release behavior of guest molecules in SF₆ and SF₆ + 4 wt% NaCl hydrates indicates that while SF₆ hydrate decompose at about 275 K, dissociation temperature of SF₆ hydrate, the escape of SF₆ molecules in SF₆ + 4 wt% NaCl hydrates was initiated rapidly at about 205 K. These results demonstrate the strong effect of temperature on both guest-host interactions and the stability of the framework structure.