Investigation of Occupation Behavior of SF_6 in SF_6 + NaCl Hydrates

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For practical application of gas hydration in distillation processes, investigation on occupation behavior of guest molecules in the presence of NaCl is essential. Herein, the hydrate phase equilibrium of SF_6+ Nacl solutions (water + 2, 4 and 10 weight % NaCl) were monitored in the temperature range 277 to 284 K and under pressures of up to 0.1 MPa. Based on equilibrium points, each dissociation heat of SF_6 + NaCl hydrates was calculated by Clausis-Clapeyron equations. In addition, structural identification of gas hydrates formed by varying the weigt fraction of NaCl relative to water was performed by both Raman spectrometer and X-ray diffraction. Further evaluation of the temperature-induced release behavior of SF_6 in pure and SF_6 + 4 wt% NaCl hydrates in the temperature range 140 to 290 K indicated that SF_6 rapidly escaped from hydrate cages at near 270 K, which almost corresponds to the dissociation temperature of these hydrates.