

SDS 첨가에 따른 SF₆ 하이드레이트 형성의 영향

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Sulfur hexafluoride (SF₆) has been widely used in a variety of industrial processes, but it is one of the most potent greenhouse gases global climate changes. For this reason, it is necessary to separate or collect it from waste gas streams. One separation method is through hydrate crystal formation. In this study, SF₆ hydrate was formed in aqueous surfactant solutions of 0.00, 0.01, 0.05, 0.15 and 0.20 wt.% to investigate the effects of the surfactant on the hydrate formation rates. The surfactant, sodium dodecyl sulfate (SDS), was tested in a semi-batch stirred vessel at the constant temperature and pressures of 276.2 K and 0.78 MPa, respectively. This surfactant showed kinetic promoter behavior for SF₆ hydrate formation. It was also found that SF₆ hydrate formation proceeded in two stages with the second stage being the most rapid. In-situ Raman spectroscopy analysis revealed that the increased gas consumption rate with the addition of surfactant was possibly due to the increased gas filling rate in the hydrate cavity.