

Measurements of Hydrate Phase Equilibria for Nitric Oxide and water system including disproportionation reaction

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Hydrate phase equilibria containing impurities are important in carbon dioxide transportation process. Impurities such as nitrogen, hydrogen, water, SO<sub>x</sub> and NO<sub>x</sub> can cause safety problems. Especially, the existence of SO<sub>x</sub> and NO<sub>x</sub> in pipelines does lead to corrosion of the equipment. The effects of the existing impurities such as sulfur dioxide and nitrogen dioxide on carbon dioxide hydrate formation have been reported. However, there were few experimental data for the thermodynamic phase equilibrium of nitric oxide with hydrate formation. Because nitric oxide is radical, it is thermodynamically unstable and can cause disproportionation in high pressure. In this work, hydrate phase equilibria for nitric oxide and water were experimentally determined in liquid-hydrate-vapor three phase regions. Also, the effect of the relative amount of water was studied.