

The Measurements of Carbon Dioxide Hydrate Equilibrium in Water and Methanol Solutions

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Carbon dioxide hydrate phase equilibrium involving inhibitor is important for the flow assurance in the transmission lines. Of the inhibitors, methanol is used the most frequently for its high volatility. In this study three-phase (Lw-H-Lg) equilibria for mixtures of carbon dioxide, water and methanol were experimentally studied for P=(5 to 20) MPa. Isobaric dissolution temperatures of formed hydrates were measured for accurately determined loading compositions of all components. Literature data for this mixture were reported with only weight fraction of methanol in the aqueous solution and are considered incomplete because the equilibrium can be sensitive to the ratio of carbon dioxide to aqueous solution. The ratio effects were verified by present data at constant weight fraction of methanol. CSMGem calculations using the program in Sloan and Koh [1] were found in general agreements with present data.

[1] E.D. Sloan, C.A. Koh, Clathrate hydrates of natural gases, 3rd ed., CRC Press, Boca Raton, FL, 2008.