

عنوان مقاله:

Investigating the effects of ethylene glycol (EG) and mixed salts as a thermodynamic inhibitor on equilibrium dissociation conditions of methane hydrates and modeling by CPA equation of state

محل انتشار:

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خلاصه مقاله:

Most of the manufacturing and processing facilities in the oil and gas industry are at high risk to hydrate formation because of the presence of appropriate conditions of pressure and temperature and a multiphase containing formation water and hydrocarbons. Formation water usually contains salt mixtures. To inhibit hydrate formation, hydrate inhibitors; generally, methanol or ethylene glycol are injected. For proper design and operation of these facilities, comprehensive information on the conditions of the formation and dissociation of gas hydrates in the presence of salt mixtures and inhibitors are essential. In this study, new experimental data for the equilibrium hydrate dissociation conditions of methane in the presence of aqueous mixtures of ethylene glycol and magnesium chloride plus potassium chloride for an extensive range of operating conditions are measured and reported. A thermodynamic model is also developed to predict the experimental data. on this model, the Cubic-Plus-association Equation of state is combined with a modified Debye Hückel electrostatic term to predict the fugacity coefficients and the solid solution theory of van der Waals and Platteeuw is used to model the hydrate segment equilibria for the studied systems. to enhance the predictions of the proposed model, the activity of aqueous solutions of ethylene glycol with different salt mixtures are measured for a wide range of concentrations at 298.15 k and atmospheric pressure. The measured data are used to correlate the activity coefficient parameters in the model. superb agreement between the predictions of the proposed model and the experimental data shows the robustness of the proposed model

كلمات كليدى:

CPA EOS; methane hydrates, MEG, Mixed Salts; Experimental measurements, Thermodynamic model

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