Correlation of Phase Equilibrium Data of CO_2 + Water Mixtures Containing Gas Hydrate using NLF-HB and MF NLF-HB EoS

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The reliable phase equilibrium data and prediction of CO_2 + Water mixture are required for the CO_2 sequestration process. Some of experimental data are available for water rich phase containing gas hydrate, which also agree well with the correlation data using NLF-HB EoS (Hydrogen Bonding Non-random Lattice Fluid EoS). But for CO_2 rich phase, experimental data are rare and also the correlation results with one binary energy parameter fitted from water rich phase data could not explain the experimental data. Two binary energy parameters based on multi-fluid approximation had been introduced in this study. The phase equilibrium data of L_W-L_{CO2}, L_W-H-L_{CO2}, L_W-H-V, and L_{CO2}-H were correlated with NLF-HB Eos and MF NLF-HB Eos. The correlation results of experimental data of CO_2 rich phase with two binary energy parameters were better and water rich phase data were correlated well with both models.