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The Performance of EOS Models in the Prediction of Vapor-Liquid Equilibria in Asymmetric Natural Gas Mixtures

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摘要 The aim of this work is to apply cubic equations of state (EOS) to vapor-liquid equilibria calculations of gas-heavy hydrocarbon systems, which are asymmetric in molecular size and are usually found in natural gases. Investigation has been done to test the validity of the original PSRK and the cubic simplified perturbed hard-chain (CSPHC) models for global phase diagrams. The calculation results show that both equations overpredict vapor pressure in the near critical region. In the prediction of the solubilities of high molecular weight (MW) hydrocarbons in the natural gas, the PSRK model gives good agreement for the dew point pressure-vapor composition diagrams. Adjustment of the pure component parameters of the CSPHC EOS for heavy components to fit the vapor-liquid equilibrium (VLE) data has been proved to give significant promoting in prediction accuracy. However, further improvement of a van der Waals EOS, such as SRK, PT and DG models for the asymmetric systems by adjusting the three pure component properties, T_c , p_c and ω , did not achieve satisfactory results for heavy components.

关键词 [equation of state](#) [natural gas](#) [vapor-liquid equilibria](#) [asymmetric systems](#)

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Key words [equation of state](#); [natural gas](#); [vapor-liquid equilibria](#); [asymmetric systems](#)

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