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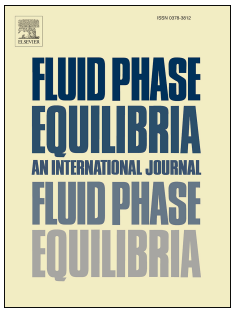

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Prediction of solid-liquid equilibrium in paraffinic systems with new solid solution model

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Abstract: A thermodynamic model for the prediction of wax precipitation with the new solid solution model is established. For liquid phase, regular solution model and Flory free-volume equation are adopted to consider the two contributions of activity coefficient: enthalpy contribution, the energetic interactions between the components, and entropy contribution, the differences in size and shape between the molecules. For solid phase, the derived solid solution model accounting for the two parts of the solid non-ideality is proposed, where an improved regular solution model is developed for the description of residual part (enthalpy contribution), on the basis of the combination of regular solution theory and local composition theory; while Wilson equation with the consideration of the end effects between molecules is used for combinatorial part (entropy contribution). The improved model is tested against the experimental data of binary, ternary, quaternary and multi-paraffins systems. All experimental data are obtained at atmospheric pressure with temperature varying from

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