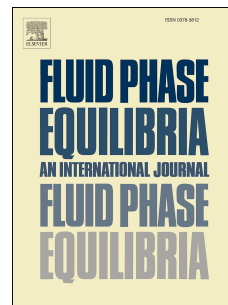


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Prediction of solid-liquid equilibrium in paraffinic systems with new solid solution model

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

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