

The Crossover Lattice Equation of State using the New sine model for the modeling of solids in supercritical fluids

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The Sanchez-Lacombe equation of state is known to describe the thermodynamic properties of molecular fluids of arbitrary size, especially polymer-solvent phase behavior. But, this EOS has limitations in predicting of thermodynamic properties near the critical point. So, in previous work, we developed the crossover lattice equation of state and presented very accurately thermodynamic properties over wide regions using this EOS. However, the XLF EOS has many system-dependent parameters, which limits the prediction ability of the XLF EOS. Especially, in modeling solid-supercritical fluid equilibria the prediction ability of the XLF EOS is more limited, because thermodynamic data for pure solids are not enough to determine pure parameters for solid components. In this research, we developed the Crossover lattice equation of state using a new sine model which has less parameters than the XLF EOS. This EOS represented solid-supercritical fluid equilibria well.