A New SAFT-like Generalized Equation of State

James Ely [C, S]
Chemical Engineering Department, Colorado School of Mines, Golden, CO, U.S.A.

We have developed a new generalized SAFT-like equation of state that is applicable to both nonpolar and polar fluids. The equation has been developed by applying a stepwise regression/threshold acceptance program to a Carnahan-Starling Helmholtz base function. As such it has a structure like the various SAFT models but in this case, the attractive term is determined from experimental data for real fluids. A unique feature of this new equation of state is that it has an explicit (universal) square-well second virial coefficient dependence, thereby simplifying the attractive terms in the equation of state. In this presentation, we will describe the development of the generalized equation of state and present the results of comparisons of the model along with other SAFT models with the base data and other pure-fluid data. The extension of the equation to mixtures will be briefly discussed and preliminary phase equilibrium and single-phase property predictions will be compared to experimental data.