A PREDICTIVE CALCULATION METHOD FOR SOLUBILITY OF SOLIDS IN SUPERCRITICAL FLUIDS USING A MODIFIED PENG-ROBINSON EQUATION OF STATE AND van der Waals MIXING RULE

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This paper proposes a method for determining the solubility of solids in supercritical fluids by correlation using the simplified Peng Robinson equation of state. This method used solubility data of 132 systems (isotherms) correlated with the equation of state by introducing two adjustable parameters, α and β, which are defined and the van der Waals mixing rule. The proposed method is considerably simpler as it requires no iterations to calculate the fugacity coefficient of the solute using cubic equations of state. The adjustable parameters are calculated for a selected number of binary systems and are then used to calculate the solubility. Then we compare the results using conventional state equations as the Peng Robinson equation of state.

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