عنوان مقاله:

Prediction of Solubility of β-Carotene as a Component in a Multicomponent System in High-Pressure Carbon Dioxide

محل انتشار:

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خلاصه مقاله:

Solubility prediction of high molecular weight molecules in high-pressure solvents is an interesting field of research. Sometimes the solubility data are not available for several components due to lacking of valid equipments. Therefore, an accurate prediction technique can help the researchers. According to the literature, the simple Equations of State (EoSs) such as Soave-Redlich-Kwong (SRK), Peng-Robinson (PR) and the others require some data such as intermolecular energy parameters, critical properties, acentric factors, and molar refractions. Since these data are not available for a lot of high molecular weight molecules, there are some limitations in applying them. Furthermore, the calculations are more complicated when the high molecular weight molecule is a polar one due to the interference of polar factors in the calculations process. The polar factors for this kind of molecules are not available or cannot easily be calculated. One of these polar biomolecules is β-carotene. In this research, the solubility of β-carotene in high-pressure carbon dioxide was calculated by a two-parameter EoS and compared with the experimental data although it had already been successfully used for binary systems,. The results showed that the two-parameter Mohsen-Nia-Modarress-Mansoori (MMM) EoS was an accurate model for the solubility prediction in supercritical and near critical conditions for the multicomponent systems. The binary coefficients of β-carotene and carbon dioxide in various .pressures and temperatures were obtained by the genetic algorithm from the literature

کلمات کلیدی:

prediction, Solubility, β-carotene, EOS