

عنوان مقاله:

Introduction of a Novel Two-Dimensional Equation of State to Predict Gas Equilibrium Adsorption in Highly-Nonideal Systems

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خلاصه مقاله:

Abstract The accurate calculations of adsorption equilibrium for multicomponent gas systems are of great importance in many applications. In this paper, five two-dimensional equations of state γ D-EOS, i.e. Van der Waals, Eyring, Zhou-Ghasem-Robinson, Soave-Redlich-Kwong and Peng-Robinson, were examined to find out their abilities to predict adsorption equilibrium for pure and multi-component gas adsorption systems. Also, a new γ D-EOS named Rahimi-Talaie (RT) was developed for accurately predicting adsorption equilibrium of the gas mixtures having highly non-ideal behavior. The pure parameters of all these equations were obtained by fitting γ D-EOS into pure gas-adsorption equilibrium data, and then the mixture parameters were calculated by recommended mixing rules. It was concluded that all equations were capable of accurately predicting pure adsorption equilibrium. However, among the six above-mentioned γ D-EOSs, RT was more successful to provide more accurate prediction of gas-mixture adsorption equilibrium, especially for the mixture showing azeotrope behavior.

کلمات کلیدی:

Equilibrium calculation, gas adsorption, two-dimensional equation of state, non-ideal mixture

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