Prediction of vapor-liquid euilibria of CO_2 containing impurities

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Accurate prediction of VLE of carbon dioxide (CO_2) in the presence of impurities is required for the CO_2 capture and sequestration. Thermodynamic properties of CO2 is affected by the presence of impurities such as methane, argon, nitrogen, oxide, hydrogen. In this work, the prediction of VLE of CO_2 is performed containing sulfur dioxide, nitric oxide, argon, oxygen, nitrogen, methane, hydrogen sulfide, hydrogen, carbon monoxide. Existing equation of states (EOS) are available for predicting VLE of CO2 mixtures such as cubic, GERG, NLFHB. Cubic equation of states is the simplest model to predict VLE of CO_2 mixtures and give reasonable results. GERG is used to calculate thermodynamic properties of mixtures containing natural gas with high accuracy. The purpose of this work is to evaluate accuracy of EOSs compared to experimental data.