

Measurement of Vapor-Liquid Equilibria for the Binary Mixture of 1,1,1,2,3,3,3-  
Heptafluoropropane  
(HFC-227ea) + Propane(HC-290)

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In recent years, the utilization of light hydrocarbons such as propane, n-butane is believed as good solution for developing CFC alternative refrigerant in the future because these are rather cheap, plentiful and environmentally benign chemicals. However they are toxic, flammable, and explosive. Secondary CFC alternative refrigerant are HFCs which have good performance and more environmentally benign, but HFCs' GWP (Global Warming Potential) are thousand higher than CFC. Mixing light hydrocarbons and HFCs can give good solution of making up for the weakness and show high potentialities to alternate CFC in the future. In this work, isothermal VLE data for binary mixture of HFC-227ea + propane at five equally spaced temperatures between 283.15 and 323.15K were measured by using a circulation-type equilibrium apparatus. The experimental data were correlated with the Peng-Robinson equation of state used the Wong-Sandler mixing rule with combine NRTL excess Gibbs free energy model. Almost all the calculated values with this model give a good agreement with the experimental data and these system exhibit azeotropes.