Measurement of Vapor-Liquid Equilibria for the Binary Mixture of 1, 1-difluoroethane (HFC-152a) + n-butane(R-600)

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Light hydrocarbons have increased their utilities since their good performances are known to the world as natural refrigerants. These are believed as nice solution for developing CFC alternative refrigerant because they are rather cheap, plentiful and eco-friendly chemicals. However they are rather toxic, flammable, and explosive. Another CFC alternative refrigerant is HFC which is a good performance and more environmentally benign, but HFC's GWP (Global Warming Potential) is thousand higher than CFC. Therefore, mixing light hydrocarbons and HFCs can give a suitable solution of overcome the weakness and show high potentialities to alternate CFC in the future. In this work, isothermal VLE data for binary mixture of HFC-152a + n-butane at five equally spaced temperatures between 273.15 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.