

Measurement of Vapor-Liquid Equilibria for the Binary Mixture of Propane (R-290) + Propylene (R-1270)

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In recent years, the utilization of light hydrocarbons (butane, propane, propylene, etc) as effective refrigerants is believed as good solution for developing CFC alternative refrigerant in the future because these hydrocarbons are rather cheap, plentiful and environmentally benign chemicals (zero ODPs and near zero GWPs) and have many outstanding properties. In order to use mixture of hydrocarbons as multi-component refrigerants, vapor-liquid equilibrium (VLE) data are required to evaluate the performance of refrigeration cycles and to determine their optimal compositions. In this presentation, whole isothermal VLE data (including new and previously reported data) for the binary mixture of propane (R-290) + propylene (R-1270) at various temperatures between 273.15 and 313.15 K are presented. All of them were measured by using a circulation-type equilibrium apparatus. The experimental data were correlated with the Peng-Robinson equation of state combined with the Wong-Sandler mixing rule. It was confirmed that the data calculated by this equation of state have a rather small difference with experimental values. The azeotropic behaviour was not found in this mixture over range of temperature studied here.