

Vapor-Liquid Equilibria for the Binary System of Dodecafluoro-2-methylpentan-3-one and Nitrogen

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Under the Montreal protocol and its amendment, all chemicals with a nonzero ozone depletion potential (ODP) are subject to phase out. Thus, halon fire extinguishing agents were regulated and were substituted by hydrofluorocarbons (HFCs) and hydrochlorofluorocarbons (HCFCs). The Dodecafluoro-2-methylpentan-3-one (FK-5-1-12) is a good candidate of halon fire extinguishing agents. FK-5-1-12 cannot be used alone due to its low vapor pressure. Nitrogen is good for pressurizing FK-5-1-12 to discharge safely. It is important to obtain the phase equilibria data for the development of FK-5-1-12 and nitrogen fire extinguishing system. Isothermal vapor-liquid equilibria data of the binary mixtures of FK-5-1-12 + nitrogen were measured at various temperatures. The experiment was carried out in a circulation-type equilibrium apparatus with measurement of temperature, pressure and the compositions of the liquid and vapor phase sample. The experimental data were well correlated by Peng-Robinson equation of state with the Wong-Sandler mixing rules.