Vapor-Liquid Equilibrium Measurements for Binary and Ternary Mixtures of R 290, R 600a and R 32 in the Temperature between 260 K and 330 K

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Because of their low ozone-depletion potentials and global warming potentials, hydrocarbons such as propane (R290, C_3H_8), n-butane (R600; n-C_4H_{10}), and isobutane (R600a; i-C_4H^{10}) are expected candidates for CFC, HCFC, and HFC alternative working fluids for refrigerator and heat pump systems. Hydrocarbons (HCs) are environmentally acceptable refrigerants; however, most HCs have the problem of flammability. In order to maintain the safety of home refrigerators and air-conditioners, mixing a small amount of HFCs with HCs may be effective.

Vapor-liquid equilibrium (VLE) measurements for the binary HC mixtures of R290 + R600 system as well as R290 + R600a system and for the binary HC and HFC mixture of R32 + R290 system have been carried out in our previous publications [1,2]. In the present study, VLE measurements for the binary mixtures of R32 + R600a system and ternary R 32 + R 290 + R 600a system are made over temperatures between 260 and 330 K. The apparatus is based on the recirculation method and has a gas chromatograph for measurements of mole fraction. The present data for the R32 + R600a mixtures at 301.8 and 321.8 K are in good agreement with the reported experimental data by J.S. Lim *et al.* [3] The present data for R32 + R600a mixtures and R32 + R290 + R600a mixtures will be compared with the REFPROP[4] program.

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