

Thermal Conductivity of Binary Refrigerant Mixtures (R125 and R134a)

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The thermal conductivity of binary mixtures of pentafluoroethane (R125) and 1,1,1,2-tetrafluoroethane (R134a) has been studied. The relative variant of the co-axial cylinders steady-state method was used. The total systematic error of these measurements was 3 %, with a confidence probability of 0.95. The temperature was measured using a platinum resistance thermometer with metering error of 0.02 K. The pressure was measured with a Bourdon pressure gage, with an inaccuracy of 0.04 %. We studied six concentrations covering all composition ranges of the mixture. The mixtures were prepared by weighing, the systematic error in composition being less than 1.5×10^{-4} mass fraction. We have obtained experimental data in the liquid and gas phases along the isobar and/or isotherm lines in the temperature range of 220 to 405 K. In the liquid phase, the pressure was varied from 15.0 MPa to pressures close to the phase equilibrium curve. In the gas phase, the pressure was varied from 0.29 to 3.63 MPa. A polynomial expression has been used to describe the data obtained; the standard deviation was less than 1.1 %. The comparison to other data is presented and discussed.