Thermal Conductivity of Saturated Liquid of HFOs and HFO+HFC Mixtures

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Hydrofluoroolefins (HFOs) which have low global warming potential are getting great attention for promising candidates of next generation refrigerants. However, their thermophysical properties have not been sufficiently measured. There are especially only a few measured data for transport properties, such as thermal conductivity and viscosity. On the other hand, HFOs cannot cover all applications which are air-conditioning, refrigeration and heat pump systems because of their limited thermophysical properties. HFO+HFC mixtures may have suitable properties for a specific application. In this paper, thermal conductivity of saturated liquid of HFOs, which are R1234fy, R1234ze(E) and R1234ze(Z), and of HFO+HFC mixtures were measured with the transient hot wire method. Two platinum fine wires with different lengths for compensation of end effects are immersed in the test liquid filled in a pressure vessel. The diameter of the wire is 15 µm and the lengths are 110 mm and 60 mm. Measured temperature range is from 10°C to 80°C. The measured thermal conductivities are compared with data obtained by other researchers. The thermal conductivities of the mixtures are between the pure refrigerants and they are slightly lower than linear interpolated values.