

An Experimental Investigation and Modeling of the Thermodynamic Properties of R245fa/Compressor Oil Solutions

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This paper presents experimental data for the solubility, density, and capillary constant for solutions of ozone-safe refrigerant R245fa with compressor oil Planetelf ACD 100 FY over a wide range of temperatures and concentrations. Based capillary constant information, the surface tension of R245fa/Planetelf ACD 100 was determined. The temperature of the normal boiling point, capillary constant, and density of the refrigerant/oil solution (ROS) data were used as initial information for the prediction of the pseudocritical temperature, pseudocritical pressure, and pseudocritical density of the ROS. The proposed methods for determination of the pseudocritical parameters of the ROS are based on the theory of thermodynamic similarity and minimization of deviations of the experimental information from the correlations for density, capillary constant, and vapor pressure of the ROS [1, 2].

This paper reports variations in the vapor pressure, density, capillary constant, and surface tension as a function of concentration for ROS R245fa/Planetelf ACD 100 FY. The enthalpy of the liquid phase of the ROS R245fa/Planetelf ACD 100 FY is calculated. An analysis of the behavior of the excess thermodynamic functions is carried out.

[1] O.O. Medvedev, P.V. Zhelezny, and V.P. Zhelezny, *Fluid Phase Equil.* **215**, 29 (2004).

[2] P.V. Zhelezny, V.P. Zhelezny, and P.V. Skripov, *Fluid Phase Equil.* **212**, 29 (2003).