

Reference Correlation of the Thermal Conductivity of *n*-Pentane, *iso*-Pentane, and Cyclopentane from the Triple Point to 700 K and Moderate Pressures

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In this work new, representative reference equations for the thermal conductivity of *n*-pentane, *iso*-pentane and cyclopentane, are presented. The equations are based in part upon a body of experimental data that has been critically assessed for internal consistency and for agreement with theory whenever possible. The thermal conductivity is correlated as a function of the density and the temperature, as a summation of three contributions; a dilute-gas term, a critical contribution term, and a residual term. Densities required are obtained from recent equation-of-state correlations. In the case of the dilute-gas thermal conductivity, a theoretically based correlation was adopted in order to extend the temperature range of the experimental data. Moreover, in the critical region, in addition to a small number of experimental data, the thermal conductivity enhancement is well represented by theoretically based equations containing just one adjustable parameter. The remaining residual contribution is obtained by empirically fitting critically assessed data. All three correlations are applicable for the temperature range from the triple point of each fluid to 700 K, and an upper pressure limit determined by the maximum density limit for the equation of state used to provide density.