

A Helmholtz-energy-explicit Equation of State for 2-propanol (isopropanol)

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We present here a new high accuracy Helmholtz-energy-explicit equation of state for the thermodynamic properties of 2-propanol (isopropanol). This equation of state is valid from the triple point temperature of 185 K to 700 K and pressures up to 1000 MPa. In total, more than 2000 experimental data points were used in the construction of this equation of state. To resolve differences in the literature data, a limited number of high-accuracy p - ρ - T data were measured on high-purity 2-propanol in the liquid phase from $T = (215 \text{ to } 420)$ K with pressures up to 27 MPa using a two-sinker, magnetic-suspension densimeter. A total of 321 p - ρ - T data at 79 (T, ρ) state points were measured. The uncertainties expected for this equation of state are 0.1% in density, 5% in constant pressure specific heat, 1% in speed of sound, and 0.2 to 0.5% in vapor pressure.