

A Reference Equation of State for the Thermodynamic Properties of Propane for Temperatures from the Melting Line to 650 K and Pressures up to 1000 MPa

E.W. Lemmon^{C,S} and M.O. McLinden

*Physical and Chemical Properties Division, National Institute of Standards and Technology, Boulder, CO,
U.S.A.*

ericl@boulder.nist.gov

W. Wagner

Lehrstuhl für Thermodynamik, Ruhr-Universität, Bochum, Germany

A formulation is presented for the thermodynamic properties of propane. The equation of state is valid for temperatures from the triple point temperature (85.528 K) to 650 K and for pressures up to 1000 MPa. The formulation can be used for the calculation of all thermodynamic properties, including density, heat capacity, speed of sound, energy, and saturation properties. Comparisons to available experimental data are given that establish the accuracy of the calculated properties. The approximate uncertainties of properties calculated using the new equation are 0.02 % in densities, 0.5 % in heat capacities, 0.03 % in speeds of sound, and 0.01 % in vapor pressures above 170 K. Deviations in the critical region are higher for all properties except vapor pressure.