

Specific Heat Capacity at Constant Volume of Propane at Temperatures from 85 K to 345 K with Pressures to 35 MPa

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Specific heat capacities at constant volume (C_V) were measured with an adiabatic calorimeter for pure propane. The high purity of the samples was verified by chemical analysis. Temperatures ranged from the triple point of propane near 85 K to the upper temperature limit of the calorimeter at 345 K, while pressures ranged from near zero to 35 MPa. Measurements were conducted on liquid in equilibrium with its vapor and on compressed liquid samples along isochroes. Specific heat results are reported for two-phase ($C_V^{(2)}$), saturated liquid (C_S), and single-phase (C_V) isochores. Vapor pressure data are reported that are based on measurements of $C_V^{(2)}$ along a 2-phase isochore. Measurements were also made to determine the triple-point temperature and heat of fusion of a solid sample near its triple point. The principal sources of uncertainty are the temperature rise measurement and the change-of-volume work adjustment. The expanded relative uncertainty (i.e. coverage factor $k=2$) for values of $C_V^{(2)}$ is estimated to be 0.5 %, for C_S it is 0.7 %, and for C_V it is 0.7 %.