

# PVT Measurements on 4'-*n*-Octyl-Biphenyl-4-Carbonitrile (8CB) up to 300 MPa

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*P*, *V<sub>m</sub>*, *T* data have been measured for the smectic, nematic and isotropic phases of 4'-*n*-octyl-biphenyl-4-carbonitrile (8CB) in the temperature range 300–370 K and pressures up to 300 MPa. At atmospheric pressure all phase transitions appear to be of first order due to a discontinuity in the density. The volume change at the smectic A – nematic transition is only a tenth of the volume change at the clearing temperature. At moderate pressures below 80 MPa the S<sub>A</sub>-N transition could be detected as a discontinuity in the period of oscillation in measurements with a high-pressure vibrating tube densimeter. At higher pressures the discontinuity seems to die away, possibly indicating a change from first order to second order transition. From the volume changes and the slopes of the transition lines we calculate the enthalpy changes at the phase transition. The *p*, *V<sub>m</sub>*, *T* data enable us to calculate the volume part of the entropy and the molecular field parameter  $\gamma = \partial \ln T_{NI} / \partial \ln V_{NI}$ .

*Key words:* 8CB; High Pressure; *pVT*; Phase Transitions; Thermodynamics.

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