

E2-41: Molecular orientational order of liquid crystals from absorption dichroic ratios

A D L Chandani, D T B Tennakoon, C C Weeraratne
(Dept Chemistry, Univ of Peradeniya)

The temperature dependence of the second order parameter, \bar{P}_2 , in the homologous series of 4-n-alkyl-4'-cyano biphenyl, nCB (n=5,6,7,8), liquid crystals was investigated by measuring the absorption dichroic ratios using 4-amino-4'-nitro terphenyl as a probe. The probe whose molecular orientation reflects the orientational order of liquid crystal molecules, shows an absorption maximum at 380nm. The absorption dichroic ratios of this probe embedded in nCB liquid crystals measured at the above wave length were used to determine \bar{P}_2 taking the various anisotropic correction factors into account.

The \bar{P}_2 value shows a continuous decrease with increasing temperature and it suddenly drops at the phase transition, indicating a first order phase transition. The variation of \bar{P}_2 with the number of carbon atoms (n) in the alkyl chain of nCB liquid crystals also exhibits a marked even-odd effect when compared at the same reduced temperature.