High-resolution calorimetric study of 12CB, 13CB and 14CB liquid crystals

G.Cordoyiannis[a], L. F. V. Pinto[b], M. H. Godinho[b] , Z. Kutnjak[c], G. Lahajnar[c], C. Glorieux[a], and J. Thoen[a]

[a] *Departement Natuurkunde en Sterrenkunde, Katholieke Universiteit Leuven, Celestijnenlaan 200D, 3001 Leuven, Belgium*

[b] *Dept. Ciência dos Materials, Universidade Nova de Lisboa, 2829-516 Caparica, Portugal*

[c] *Condensed Matter Physics Department, Institute Jožef Stefan, Jamova 39, 1001 Ljubljana, Slovenia*

A high-resolution calorimetric study of the higher members of the cyanobiphenyls (*n*CBs), namely the dodecylcyanobiphenyl (12CB), tridecylcyanobiphenyl (13CB) and tetradecylcyanobiphenyl (14CB), has been performed by means of adiabatic scanning calorimetry (1). All the compounds exhibit solely the smectic A mesophase and exhibit first-order isotropic-to-smectic A (*I*-Sm*A*) and smectic A-to-crystal (Sm*A*-*Cr*) transitions. The odd-even effect present for the lower (*n*=5-9) homologues is also observed for the higher (*n*=10-14) smectic ones, in both the transition temperatures and the enthalpy values.

A general phase diagramme is given for all *n*CBs (*n*=5-14), based on the present measurements of 12CB, 13CB and 14CB as well as on our previous high-resolution studies (2,3). An overview of the latent heats released in the isotropic to nematic (*I*-*N*) and *I*-Sm*A* phase transitions is presented (4).

References

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