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Adiabatic Scanning Calorimetric Investigation of the Smectic-A to Hexatic-B Phase Transition in the Liquid Crystal 65OBC. JAN THOEN, BERT VAN ROIE, KATLEEN DENOLF, GUIDO PITSI, Lab. Akoestiek en Thermische Fysica, Dept. Natuurkunde en Sterrenkunde, Katholieke Universiteit Leuven, Celestijnenlaan 200 D, B-3001 Leuven, Belgium — Adiabatic scanning calorimetry (ASC) was used to investigate the smectic-A to hexatic-B (SmA – HexB) phase transition in the liquid crystal n-hexyl-4'-n-pentyloxybiphenyl-4-carboxilate (65OBC). The high- resolution ASC technique allows one to measure simultaneously the enthalpy and specific heat capacity as a function of temperature and separate the true latent heat at (weakly) first-order phase transitions from pretransitional enthalpy changes. We were able to prove in a direct way that the SmA – HexB transition in 65OBC is very weakly first-order with a latent heat of 0.04 +/- 0.02 J/g. Our experiments also confirm the high value of 0.64 +/- 0.05 for the critical specific heat capacity exponent earlier reported in literature, suggesting closeness of the transition to a tricritical point.

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