

Abstract Submitted
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Calorimetric study of aligned liquid crystal + aerosil¹ F. CRUCEANU, G. S. IANNACCHIONE, Worcester Polytechnic Institute, D. LIANG, R. L. LEHENY, Johns Hopkins University — A high-resolution ac-calorimetric study was performed on magnetically aligned colloidal dispersions of 8CB and aerosil spanning the weakly first-order $I-N$ and second order $N-SmA$ phase transitions. Stable aligned samples were prepared by repeated cycling between the isotropic and nematic phase in the presence of a 2 T magnetic field. Zero-field measurements were carried out on six aligned conjugate density samples ranging from 0.03 to 0.15 g cm⁻³ (mass of aerosil per volume of liquid crystal). For comparison, two unaligned samples from the same batch (0.05 and 0.13 g cm⁻³) were also studied. The unaligned samples reproduce very closely previous studies on this system. The magnetically aligned samples, exhibits lower transition temperatures for the same aerosil density sample and a shift to higher aerosil density of the non-monotonic T_c evolution. The clear differences between aligned and unaligned sample indicate the “memory” of the magnetic field even after heating deep into the isotropic phase. The origin of this “memory” remains unexplained.

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