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Study of Phase Transitions in Barium Titanate - Liquid Crystal Nano-colloidal Suspensions KRISHNA SIGDEL, GERMANO IANNACCHIONE, Worcester Polytechnic Institute — A high-resolution ac-calorimetric study of the isotropic to nematic (I-N) and the nematic to smectic-A (N-SmA) phase transitions in nano-colloidal suspensions of Barium Titanate ($BaTiO_3$) in the liquid crystal (LC) octylcyanobiphenyl (8CB) as a function of $BaTiO_3$ concentration is reported. Heating and cooling scans were performed for all samples (0.1 - 1.4 wt% of $BaTiO_3$ and pure 8CB) over a wide temperature range well above and below the two transitions. Both the I-N and the N- SmA transitions evolve in character and have their transition temperatures shift lower as the wt% of $BaTiO_3$ increases. Increasing hysteresis with increasing concentration is also observed at the I- N transition between heating and cooling scans within the two- phase I+N coexistence region. These results will be contrasted with other LC colloidal dispersion systems.

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