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Effect of quantum dots on the isotropic to nematic and nematic to smectic-A phase transitions in nano composites PARVATHALU KALAKONDA, GERMANO S. IANNACCHIONE, WPI — Modulated Differential Scanning Calorimetry (MDSC) is used to investigate the weakly first-order isotropic to nematic (*I-N*) and the continuous nematic to smectic-A (*N-SmA*) phase transitions of the liquid crystal octylcyanobiphenyl (8CB) doped with well-dispersed quantum dots (QdS) as a function of Qd concentrations. Thermal scans were performed for all samples having Qd (CdS) weight percent from $\phi_w = 0.3$ to 3 wt% first on cooling and then heating under near-equilibrium conditions. The I-N transitions heat capacity peak first grows then decreases in magnitude with increasing ϕ_w leaving a maximum at $\phi_w = 0.3\%$. The N-SmA heat capacity peak remains bulk-like for all samples. Both transitions temperatures shift lower monotonically by 3 K for $\phi_w = 0.3\%$. The enthalpy of both transitions evolve in a nontrivial way, generally decreasing with increasing ϕ_w . These results are discussed in terms of the predominate disordering effects of the Qds.

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