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Non-equilibrium Crystallization Kinetics of an Induced Transition Observed in a Nano-Colloidal Liquid Crystal-Aerosil Dispersions¹ DIPTI SHARMA, Worcester Polytechnic Institute — A new transition feature, termed "Induced Crystallization" (IC), has been observed in a nano-colloidal liquid crystal (octylcyanobiphenyl, 8CB) and aerosil gel system dependent on silica content. This IC feature exhibits apparent activated kinetics following Arrheniuslike behavior. Temperature scans were performed on heating using a DSC technique at ramp rates from 1 to 20 K/min and the aerosil density varied from 0 to 0.2 g/cc. For the 8CB+sil, a well resolved exothermic peak was found as an additional feature on heating scan before the melting transition, absent in bulk 8CB. As the sil density increases, the observed the enthalpy increases while the effective activation energy decreases for this IC feature, eventually saturating at the highest density studied. This behavior appears consistent with molecular disorder imposed by the surface molecular interaction, inducing slow glassy crystallization of the 8CB liquid crystal.

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