

Abstract Submitted
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Effect of Alignment on smectic A to nematic phase transition of the aligned octylcyanobiphenyl nano-liquid crystal DIPTI SHARMA, Wentworth Institute of Technology, Boston, MA — Liquid Crystals (LCs) exhibit a wide range of mesomorphic phases for long range of applications either in the bulk form or as compounds and mixtures. In the smectic LC devices, more attention has been paying to get smectic phase transition earlier with higher quality reachers are showing their interest in the laser beam steering and the optical shutter applications to know how fast the smectic phase transition can be reached. Our interest is to understand the smectic A to nematic (SmA-N) phase transition behavior in the regard of its faster response. This study shows the effect of alignment on the activated kinetics of the SmA-N phase transition of the bulk octylcyanobiphenyl (8CB) under the effect of magnetic field. A detailed thermal analysis was performed for the aligned 8CB using high resolution calorimetry technique. A significant temperature shift in the transition peak was found towards higher temperature as ramp rate increases following Arrhenius behavior. This behavior gives the information of the energy dynamics of the molecular motion and rearrangement of 8CB molecules near the SmA-N transition. The presence of alignment brings faster response time, an increased energy dynamics with higher activation and would be helpful in the industrial area of liquid crystal devices.

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