Abstract Submitted
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Phase diagram of a binary liquid crystal mixture involving induced mesophase transitions[1] TSANG-MIN HUANG, THEIN KYU, University of Akron, SHILA GARG, KATHY MCREARY, The College of Wooster, UNIVERSITY OF AKRON COLLABORATION, THE COLLEGE OF WOOSTER COLLABORATION — Phase transition temperature versus composition phase diagram of a binary nematic mixture (MBBA/5CB) has been established based on polarized optical microscopy and differential scanning calorimetry. The observed phase diagram is of an azeotrope type with a unique induced smectic phase, which is not present in neat constituents. This induced mesophase reveals a mosaic texture reminiscent of a smectic-B or a higher order smectic phase. At extreme compositions, the coexistence of nematic and solid crystal phases can be identified. Wide-angle x-ray diffraction was employed to determine the ordered mesophase structures. A theoretical model is being developed in the context of Flory-Huggins theory for liquid-liquid demixing in conjunction with a modified Maier-Saupe-McMillan theory to elucidate the interplay among nematics, higher order smectics, and eutectic crystals.

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