

Abstract Submitted
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Effect of molecular architecture on the phase diagram of multi-arm acrylate and nematic liquid crystal mixture¹ SCOTT MENG, HATICE DURAN, THEIN KYU, University of Akron — The effect of molecular architecture on the phase behavior of a binary mixture was investigated by varying the number of functional arms in one component. A new free energy expression was derived from the first principle to account for the entropic correction, when the molecular topology changes from a linear structure to a star shape. In particular, the mixtures of nematic liquid crystal and multi-arm acrylate were selected as our reference systems, owing to their importance in the fabrication of switchable photonic crystals via photolithography. Theoretical phase diagrams have been calculated based on the combination of Flory-Huggins free energy of isotropic mixing, Maier-Saupe free energy of nematic ordering, and the entropy correction term. Good accordance was found between the model predictions and the cloud point curves.

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