

Abstract Submitted
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Phase equilibria and crystallization in mixtures of azobenzene chromophore and triacrylate¹ GARRETT O'MALLEY, Bucknell University, KENNETH MILAM, NAMIL KIM, THEIN KYU, University of Akron — A temperature versus composition phase diagram of azobenzene chromophore/triacrylate system was established by means of differential scanning calorimetry (DSC). The isotropic liquid (I) and crystal solid + liquid ($Cr_1 + I_2$) coexistence regions bound by liquidus and solidus lines were tested with the theoretical curves obtained by self consistently solving the combined free energies of Flory-Huggins (FH) theory for isotropic mixing and phase field (PF) theory for crystal solidification pertaining to the compositional order parameter (ϕ_1, ϕ_2) and the crystal order parameter (ψ_1), respectively. With the aid of phase diagram, various phase morphologies were mapped through thermal quenching into various coexistence gaps. Azobenzene in the blend produced multiple crystal structures, including gigantic single crystals. Real time images demonstrating the nucleation and growth of the crystallization process were captured under polarized optical microscopy. The spatiotemporal growth of such single crystal has been elucidated theoretically using the time-dependant Ginzburg Landau (TDGL) dynamics.

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