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Miscibility behavior of blends of spiropyran chromophore and mesogenic diacrylate[1] HARRIS LAM, University of New Orleans, NAMIL KIM, THEIN KYU, University of Akron — The phase diagram of blends of photochromic molecule (spiropyran) and mesogenic diacrylate monomer (RM257) has been constructed experimentally and theoretically. The phase diagram involving solid-liquid phase transition has been investigated using differential scanning calorimetry (DSC) and subsequently the theoretical calculation was performed by self-consistently solving the combined free energies of Flory-Huggins (FH), Maier-Saupe (MS), and phase field (PF) theory. The simulated phase diagram composed of various coexistence regions involving single component mesophases (Cr_1, Cr_2, N_2) and several coexistence phases ($Cr_1 + I_2$, $Cr_1 + N_2$, $Cr_1 + Cr_2$) accorded well with the experimental results. These predicted coexistence regions have been further confirmed by conducting several temperature quench experiments into these coexistence gaps by means of optical microscopy (OM). The development of phase morphology will be discussed in relation to the phase diagram.

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