

Abstract Submitted
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Effect of intensity gradient profiles on crystal growth subject to holographic free radical photopolymerization¹ THEIN KYU, PANKAJ RATHI, SOOJEOUNG PARK, University of Akron — A theoretical model has been developed to describe a unique phenomenon of photopolymerization-induced crystallization subjected to holographic intensity gradient profiles. A hypothetical phase diagram of a crystalline polymer solution (or blend) is constructed to guide the dynamics of directional crystallization. Calculations of holographic photopolymerization induced crystallization were carried out slightly above the melting temperature of the bends under the conditions of sinusoidal as well as sharp (square) interface. In the case of periodically varying interface, the dynamic calculations revealed that the emerged crystals (spherulites) have out-grown the patterned regions, which is consistent with the crystal growth behavior of the polyethylene oxide/diacrylate system. However, in the case of a sharp holographic the directional growth occurs along the stripes, which is confined within the stratified layers.

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