

Abstract Submitted
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Formation of Large Chiral Domains in the B4 Phase by Nucleation and Chirality-Preserving Growth of Helical Filaments¹ D. CHEN, M.A. GLASER, J.E. MACLENNAN, N.A. CLARK, Department of Physics, University of Colorado at Boulder, USA, E. KORBLOVA, D.M. WALBA, Department of Chemistry and Biochemistry, University of Colorado at Boulder, USA — The growth of helical filaments in the B4 phase is investigated in mixtures of a bent-core mesogen (NOBOW) and a calamitic mesogen (8CB). Due to freezing point depression, the B4 phase forms directly from isotropic phase in the mixtures. This enables us to show, for the first time, that the left- and right- chiral domains are composed of left- and right- handed helical filaments respectively. The formation of a chiral domain can be described as a nucleation and growth process, starting from a nucleus of arbitrary chirality. Starting from such a nucleus, the local chirality is maintained by chirality-preserving growth of helical filaments. The formation of large chiral domains in the mixture is due to the low density of nucleation sites. A tree branching model of the B4 helical filament growth has been proposed which accounts for the observed local homochirality of the helical filaments and the local phase coherence between the helical filaments.

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