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Drag of Micro-Particles by an Extended Nematic-Isotropic Interface

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Abstract:

We studied the behaviour of polymer particles in a moving interface between the nematic(N)and isotropic(I)phases of a nematic liquid crystal(LC). We showed that theNI-interface is extended(E)and has a layeredN-I-Nstructure in the vertical cross-section of the sample; the wedge of the isotropic phase is bounded by the nematic phase, which is limited by the cell substrates. The minimum of the cell free energy defines the position of particles in the interface region. We find that the preferable position of the particle is at the vertex of the wedge formed by the isotropic phase. The particles are captured by the vertex line and follow the interface when it moves.

Keywords:

drag effect, nematic-isotropic liquid interface, nematic liquid crystal, polymer particles

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