Dynamics of Evolution of Striped Structures in Liquid Crystals

DENG-KE YANG — In liquid crystals, there are many types of striped structures, such as disclinations and domain walls as well as structural fingers. Depending on their free energy is positive or negative (compared with the background structure), they will shrink or grow with time. We can describe well their dynamic behavior by considering the balance between the line tension (free energy per unit length) of the striped structure and an effective viscosity force which is the product of the shrinking (or growing) speed and an effective translational viscosity coefficient. We calculate the translational viscosity coefficient in terms of the rotational viscosity coefficient and the area of the cross section of the stripe. This theory agrees well with experimental results.

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