Orientation structures of nematic liquid crystal in ellipsoidal droplets

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A liquid crystal composite material can be an ensemble of liquid crystal droplets surrounded by an isotropic medium. The optical properties of such materials are determined primarily by the orientational structure, which is formed in liquid crystal droplets and can be easily controlled by various external factors. The director distribution inside the droplet depends on the properties of a liquid crystal material, shape and size of the droplet, boundary conditions, and an applied electric or magnetic field. In this work, we review the impact of the droplet shape, the external electric field and the type of boundary conditions on the orientational structure of the nematic droplets. We compare the results of computer simulations with the experimental data and make conclusions on behavior of these systems under various conditions.

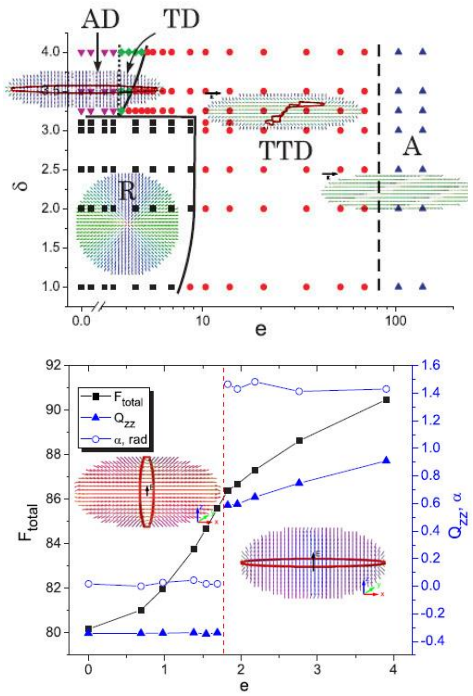

Fig. 1. (a) Phase diagram for oblate droplets with homeotropic boundary conditions; (b) phase transition under action of electric field.

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