

Light Scattering Study of a Lyotropic Chromonic Nematic

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Abstract

We have studied light scattering from a uniformly aligned planar cell of a lyotropic chromonic nematic (14 wt. % water solution of Disodium Cromoglycate, see [1,2] for references) in two geometries, with the nematic director being either perpendicular or parallel to the scattering plane. Relaxation modes of thermal orientational fluctuations corresponding to splay, twist and bend elastic deformations have been identified from the Correlation Functions measured for different scattering angles in the range between 4° and 65° . Ratios of Frank elastic constants K_1/K_2 , K_3/K_1 and K_3/K_2 have been determined from two independent sets of data for the relaxation times and amplitudes of the modes, respectively, fitting their q-dependencies. Temperature behavior of the relaxation modes approaching the phase transition to the isotropic phase has been studied at fixed scattering angles.

The research was supported by US National Science Foundation DMR grant 0710544 and by Samsung Electronics Corp."

References

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