One order parameter tensor mean field theory for biaxial LCs

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I will present a simple one tensor mean field model of biaxial nematic liquid crystals. The salient feature of this approach is that material parameters appear explicitly in the order parameter tensor. The free energy is constructed from a mean field potential based on anisotropic dispersion interactions. The order parameter tensor and its elements are identified, and self-consistent equations for these are obtained by minimizing the free energy. The self-consistent equations are solved numerically. The results are illustrated in a 3D ternary phase diagram. The phase behavior can be simply related to molecular parameters. The results may be useful for designing molecules that show a thermotropic biaxial phase.