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A Molecular View of Liquid Crystalline Elastomers and Gels

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A combination of Monte Carlo and molecular dynamics simulations is used to examine the order-disorder transitions that arise in model liquid crystalline elastomers and colloidal gels as a function of concentration and strain, respectively. Two models are considered. In the first, a lattice model is used to represent a colloidal gel of nematogens and nanoparticles. In the second, a cross-linked elastomer of Gay-Berne mesogens is adopted to examine the order-disroder transition that arises as a function of strain. The results of simulations are compared to those of recent experiments for these two classes of systems.