

Slave Master Mechanism in Liquid Crystals

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We study basic driving mechanisms behind the universal *slave-master* mechanism in simple two component mixtures. The key feature of the mechanism is that one component strongly influences the other while the reverse influence is negligible. For this purpose we consider systems where each pure components exhibits a phase transition on varying a control parameter (e.g. temperature, pressure, concentration of one component) to which we refer as the generalized temperature. An example of such a system presents a mixture of liquid crystal molecules and anisotropic nanoparticles (1). We present minimal models that shows robust and universal (i.e. independent of microscopic details) *slave-master* behaviour. Qualitatively different behaviours can be triggered via specific nature of the inter-component interaction. We show microscopic basis of different possible coupling terms.

(1) P. Schoot, V. Popa-Nita, S. Kralj *J. phys. chem., B Condens. mater. surf. interfaces biophys.*, **2008**, *112*, *iss. 15*, 4512-4518