

Joint CQSE and CASTS Seminar

Weekly Seminar
May 4, 2012 (Friday)

TIME May 4, 14:30 ~ 15:30
TITLE The shape dynamics and the size selection of the multi-lamellar vesicles
SPEAKER Prof. Chun-Yi David Lu
Department of Chemistry, National Taiwan University
PLACE Rm716, CCMS & New Physics Building, NTU

Abstract

It is known that the lamellar liquid crystal has an unusual structure transition in the shear flow, which seems to be present only in the multi-component lamellar phase. The non-equilibrium multi-lamellar vesicles with well defined size are formed in the shear flow. In this talk, I will discuss the dynamic relaxations of the multi-component lamellar phase. The slowest relaxation rate, in which the solvent is squeezed between the neighboring bilayers, is particularly important, as it is strongly excited by the applied flow. Its relaxation rate correlates closely with the formation shear rate. In a given shear rate, the dynamic free energy density depends non-monotonically on the size of the multi-lamellar vesicle. Compared with the experimental data, we find that the minimal free energy density criteria selects the vesicle size at that shear rate.

