General phase behavior of amphiphile-water systems: A theoretical study

Mukesh Chandra Bos* and Santosh Prasad Gupta

Department of Physics, Patna University, Patna - 800005

ABSTRACT

In the present report, we have introduced a simple one scalar order-parameter Ginzburg-Landau theory for binary mixtures of water and amphiphile. The scalar order parameter describes the amphiphile concentration. Phase diagrams are calculated by minimizing the free energy functional. Several ordered lyotropic phases such as body centered cubic (BCC) & hexagonal phases both direct (I) and inverse (II) and lamellar phases were found to be exist. The phase diagrams show the sequence of ordered phases: body centered cubic (BCCI) - Hexagonal (HI) - Lamellar (Lα) - Hexagonal (HII) - body centered cubic (BCCII) with increasing amphiphile concentration, commonly observed in such systems.