

A thermodynamic approach to phase coexistence in ternary cholesterol-phospholipid mixtures

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Abstract

We present a simple and predictive model for describing the phase stability of ternary cholesterol-phospholipid mixtures. Assuming that competition between the liquid and gel organizations of the phospholipids is the main driving force behind lipid segregation, we derive a phenomenological Gibbs free-energy of mixing, based on the calorimetric properties of the lipids main transition. Gibbs phase diagrams are numerically obtained that reproduces the most important experimental features of DPPC-DOPC-Chol membranes, such as regions of triple coexistence and liquid ordered -liquid disordered segregation. Based on this approach, we present a scenario for the evolution of the phase diagram with temperature. Results for other phospholipid species, such as POPC or PSM will also be presented.

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