

Lattice Structure of Phospholipidic Molecular Domains at the Liquid-Gas Interface

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Abstract

We make a mathematical analysis of the structure of the two dimensional lattice formed by the centers of parallelly aligned and arbitrarily oriented spherocylindrical phospholipidic molecules hexagonally packed in cylindrical domains forming a monomolecular Langmuir film at the liquid-gas interface. The analysis is carried out as a function of the tilting angle θ and the tilting azimuth ϕ . We give a number of expressions for the *lattice radius vector*, and introduce the *Lattice Generating Operator*. We also present a number of theorems dealing with the existence and characteristics of the *common points of tangency*, the *double stationary points*, the *locus circles*, and the *envelop circles*, related to the lattice sites.