

EVOLUTION AND MORPHOLOGY OF 2D CHIRAL STRUCTURES OF QUINOLINE DERIVATIVES AT THE AIR-WATER INTERFACE.

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The development of methods to build well-ordered assemblies of molecules into larger structures is a current objective of supramolecular chemistry. In this sense, the air-water interface is an ideal model for these purposes, as it is easy to prepare in a pure state and also because the surface coverage can be smoothly adjusted by using the Langmuir trough technique. However, Langmuir monolayers are interesting not only in a fundamental way but also as a means to build an ordered system on mesoscopic length scales. The domains observed in Langmuir monolayers at high surface pressures indicate the formation of large structures. To design well-defined structures in which the lateral organization is controlled, the geometry of the structures formed depends crucially on a proper balance between the vertical sections of the hydrophobic and hydrophilic groups.

The method used here, under the condition of a suitable balance between the sizes of the hydrophobic and polar groups, is based on the following: if a_c is the interfacial area occupied by the hydrophobic group when alkyl chains are fully extended, and a_0 is the minimum interfacial area occupied by the headgroup, dyes to be selected should obey $a_c \geq a_0$. In this way, the domain structure depends on the ability of the dye to fill the available area excess ($a_c - a_0$). This fact stabilizes the monolayer and enables the domains growth to mesoscopic sizes. Therefore, mixed DMPA:S10A 1:1 monolayers were prepared at the air-water interface. The evolution of the domains to a supramolecular lattice were directly observed by BAM and chiral structures were determined in Langmuir-Schaeffer films.

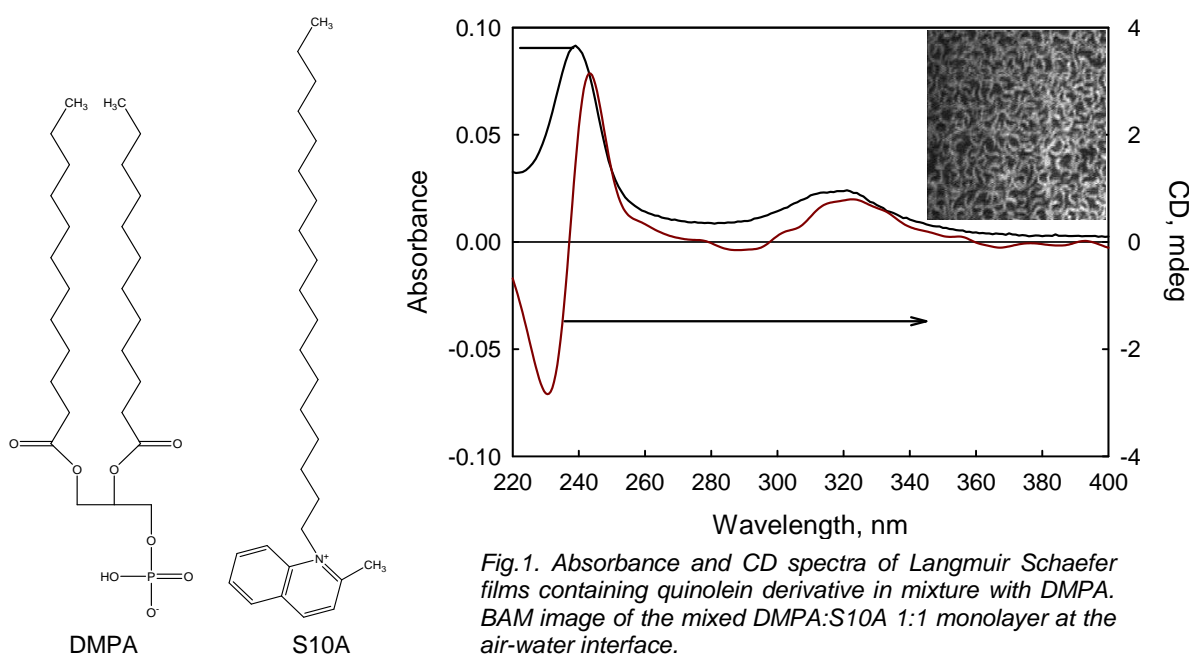


Fig.1. Absorbance and CD spectra of Langmuir Schaefer films containing quinolein derivative in mixture with DMPA. BAM image of the mixed DMPA:S10A 1:1 monolayer at the air-water interface.