CICLO DE SEMINARIOS 2011

SMAT-C Soft Matter Research and Technology Center

"Organic chain molecules and biological membranes onto solid surfaces for applications in Nanotechnology "

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Applications in Bionanotechnology and related nanotechnological areas depend on the knowledge of biophysical properties that permit the development of structure, growth, phase transitions, and dynamics of organic films and membranes adsorbed on solid surfaces. Our studies focus on films of flexible chain-like molecules, such as alkanes [CnH2n+2], and Di-palmitoyl phosphatidyl choline (DPPC) liposomes over SiO2 surfaces. Whereas SiO2 surfaces are the basis for microelectronic developments, alkanes are flexible hydro-carbonated chain molecules of general interest in materials science as prototypes of more complex polymers used in coatings and biological surfaces. DPPC liposomes are the archetypical prototype for biological membranes, with applications in signal conductance and transduction, being also the natural support for the integration of complex biological molecules, as proteins, with nanoscale surfaces and other nano-devices.

We use very high-resolution ellipsometry (VHRE) and stray light intensity measurements (SLI) in combination with imaging ellipsometry (IE) to study growth, wetting and roughness of thin organic films (chain molecules and DPPC membranes) and Atomic Force Microscopy (AFM) to characterize the nanoscale film topography. Scanning electron mircroscopy (SEM) is used to analyze on a larger scale the dependence of coverage and film topography on the applied deposition method and layer thickness. In addition, we study the desorption kinetics of selected chain molecules from SiO2 films using thermally programmed desorption.

Acknowledgments: FONDECYT Grant Nos. 1060628, 1100882 (Ulrich Volkmann) and 1060634 (Alejandro Cabrera).

MARTES 4 OCTUBRE 2011, 13:00 HORAS

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