

Characterization, Modification and Engineering of Interfaces at Nanostructured Organic and Hybrid Materials

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This talk covers two general classes of interfaces at (1) organic-inorganic hybrids and (2) ultrathin polymer films with an emphasis on their characterization, modification and engineering.

Atomic Force Microscopy (AFM) technique is presented as a powerful tool for the characterization of interfaces between components in hybrid materials. In addition, interfaces at zeolite-polymer and metal-polymer composites are modified and engineered for gas separation and sensing applications, respectively.

For the second topic, wrinkling/cracking phenomena methodology will be introduced for determining fundamental mechanical properties of ultrathin films as well as patterning. This technique is successfully employed to study the confinement effect of ultrathin polymer films and chemical stability of desalination membranes. Finally, a new approach to design organic networks used in desalination membranes will be presented.