UFR de Chimie

Master Molécules, Matériaux, Surfaces

université PARIS DIDEROT

Séminaire de Chimie Autour des Nanosciences

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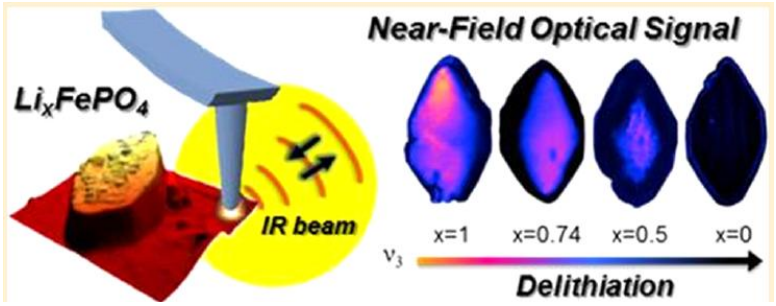
Donnera une conférence sur le thème :

NEAR-FIELD TECHNIQUES FOR THE DIAGNOSIS OF ENERGY MATERIALS

Since the early 80's, the large development of **scanning probes based microscopy** (i.e. near-field microscopy) like Scanning Tunneling Microscopy (STM) and Atomic Force Microcopy (AFM) has enabled characterization of materials (topography, conductivity, mechanical properties…) at the nanoscale under various conditions (UHV, controlled atmosphere, in liquid) as well as local modification, *i.e.* nanolithography, electrodeposition.

SPM techniques have also been implemented to characterize battery materials (surface structure, volumetric expansion) and more recently the Solid Electrolyte Interphase (**SEI**) under *in operando* conditions, despite the fragile nature of the SEI. In this presentation, an example of a study of the interfacial properties of tin electrodes using in operando AFM measurements associated with other post mortem characterization techniques will be presented.

Although really versatile and easily accessible today, these scanning probe techniques still suffer from the **lack of simultaneous chemical characterization** (composition, structure) to complete full diagnosis of functional materials. A new generation of local probe techniques associating SPM and vibrational spectroscopy (SPM/Raman, SPM/IR), the so-called scanning near field optical microscopy (**SNOM**) has recently emerged and will open new avenues in the characterization of nanomaterials. The scattering SNOM techniques (**s-SNOM IR** and Tip Enhanced Raman Spectroscopy: **TERS**) will be introduced in this presentation and illustrated with a few studies recently published[9-11], namely the Li -transport mechanism in $LiFePO_4$ micro crystals.



LE VENDREDI 29 Janvier À 11H00

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