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## **X-Ray Photoelectron Spectroscopy and Auger Electron Spectroscopy Investigations of Li- and Na-Ion Batteries**

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### **Abstract:**

Abstract: The study of surfaces and interfaces is one of the main fields of material science because it partially checks the properties of solids. This domain requires specific techniques of surface analysis such as X-Ray Electron spectroscopy (XPS), Auger Electron Spectroscopy (AES), Secondary Ion Mass spectrometry (TOF-SIMS) or Scanning Probe Microscopies (AFM – STM). After a brief reminder of the complementarity of these techniques for the surface study, several examples of application of the electronic spectroscopy related to material for electrochemical storage will be proposed. The context of the study of surfaces in Li (Na) ion batteries (reactivity with air, reactions to the interfaces, complex mixture of species, evolution in time...) will be presented. The seminar will suggest, from several examples from our group, to show the different AES and XPS probes (core peaks, satellite peaks, valence bands, coupling with gaseous absorption) or exploitation modes (spectroscopy, imagery) to identify the redox process of a battery and / or the composition of interfaces. These phenomena are essential to understand the performances of Li (Na) batteries in relation with electrochemical properties.

Contribution:

Invited