

Séminaire SOLEIL

X-ray photoelectron spectroscopy at the water-nanoparticle interface

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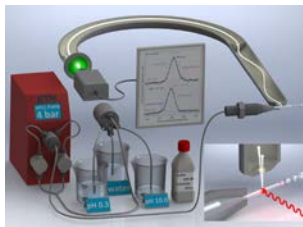
Invité par **Giorgia OLIVIERI**

Lundi 8 décembre à 14h00

Grand Amphi SOLEIL

Séminaires

We begin by describing our new Near Ambient Pressure Photoemission (NAPP) endstation at the Swiss Light Source and how it allows for the extension of in situ X-ray Photoelectron Spectroscopy (XPS) to the liquid-nanoparticle interface of colloidal suspensions (Figure). Our measurements to date have primarily focused on geometric and electronic structures of silica (9 nm α -SiO₂), tin oxide (3 nm SnO₂) and hematite (30 nm Fe₂O₃) dispersions at the liquid-air interface in both aqueous and non-aqueous solvents. These measurements have revealed (i) the spatial distributions of the NPs at the air interface and (ii) their true surface potential. The latter has been extensively investigated in relation to the effects of specific anions and cations, pH and temperature, and has allowed for a complete measure of the electrical double layer structure at a water-nanoparticle interface. In the case of α -SiO₂, interpreting our data using the simplest assumptions and most straightforward understanding of Guoy-Chapman-Stern theory reveals an outer Helmholtz plane whose thickness corresponds to a single layer of water molecules hydrating the silica surface, plus the radius of the hydrated monovalent cation. Our results subject electrical double layer theories to direct and falsifiable tests that have proven elusive for well over a century, and reveal a physically intuitive, but quantitatively verified picture of the Stern layer that is consistent across multiple electrolytes and solution conditions.



Ce séminaire sera suivi d'une pause-café



Formalités d'entrée : accès libre dans l'amphi du Pavillon d'Accueil. Si la manifestation a lieu dans le Grand Amphi SOLEIL du Bâtiment Central, merci de vous munir d'une pièce d'identité (à échanger à l'accueil contre un badge d'accès).

SYNCHROTRON SOLEIL

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