

Operando soft x-ray spectroscopy (XAS and RIXS) characterization of interfacial charge transfer in energy materials and catalysis

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Amphithéâtre SOLEIL

Soft x-ray spectroscopic techniques with operando capabilities offer the unique characterization in energy materials and catalysis in regards to the functionality, complexity of material architecture, chemical interactions. A particularly powerful soft x-ray technique is the resonant inelastic x-ray scattering (RIXS), which provides access to elementary excitations, such as d-d (f-f) excitations, vibrational excitations, and charge transfer effects that are critical for energy-related materials and chemical functions. Current in situ soft x-ray spectroscopy techniques (XAS and RIXS) at the ALS already provide element-specific access to local chemical states in liquids, gas-phase molecules, and at solid/liquid interfaces and solid/gas interfaces during catalytic or electrochemical reactions. I will give a brief introduction on the ALS RIXS Program and overview a number of the experimental studies that successfully revealed the catalytic and electrochemical reactions at solid/gas and solid/liquid interfaces in real time, e.g. electrochemical interface of photocatalysis and batteries. The experimental results demonstrate that the operando soft x-ray characterization provides the unique information for understanding the real reaction mechanism. Also, an extension of this method toward simultaneous spatial- (100 nm) and time-dependent (ns to μ s, ms) RIXS probing of electronic and chemical dynamics is envisioned in the ALS-U strategic planning.



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)

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