

Surface sensitive x-ray diffraction from model catalysts at work

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**Lundi 9 décembre 2019 – 14h00
Amphithéâtre SOLEIL**

Catalysts are complex material systems consisting of alloy metal nanoparticles on highly branched oxide supports. They are widely employed in chemical industry, in fuel cells and in car exhaust control systems, where they accelerate desired chemical reactions. To improve catalyst performance, the time-resolved atomic-scale understanding of the interplay between the catalyst surface structure, the catalytic activity/selectivity, and the surrounding gas phase is required.

Surface x-ray diffraction, at conventional (10-20 keV) and high photon energies (70-80 keV), provides atomic-scale information on the surface structure of model catalysts, even under harsh operando conditions characterized by elevated temperatures and pressures. In my presentation I will demonstrate how SXRD and HESXRD can be applied operando to investigate different model catalysts, such as single crystals and oxide-supported epitaxial metal nanoparticles. I will present our results on (1) the reaction-induced composition- and shape-dependent sintering of alloy nanoparticles, (2) on the correlation between catalyst surface structure and gas phase during self-sustained reaction oscillations, and (3) on the correlation between nanoparticle facet structure and catalytic activity/selectivity.



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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