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Surface X-ray Diffraction for the operando study of model catalyst surfaces at work

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Catalysts are key for paving the way towards a sustainable future: they accelerate essential chemical reactions such as the conversion of CO₂ into the fuel methanol in heterogeneous gas catalysis, or the splitting of water into green H₂ at the solid/liquid interface using solar and wind power. To improve catalyst efficiency, the direct correlation between the catalyst structure and activity needs to be understood under the harsh operando conditions.

In this presentation I will show how Surface X-ray Diffraction can be used to unravel the surface structure of various model catalyst systems under working conditions. The data demonstrate that not only the restructuring of 2D films on single crystal surfaces can be followed under operando conditions but that even the structural changes of nanoparticle facets can be resolved. The presentation will also discuss the benefits of using high (70-80 keV) and low photon energies (10-20 keV).

Please select the related topic from the list below

Thin films and interfaces in soft matter and materials science

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Session Classification: Thin films and interfaces in soft matter and materials science III