



Leibniz-Institut für Analytische
Wissenschaften – ISAS – e.V.

COLLOQUIUM

**Quantitative detection of adsorbates at the solid-liquid
interface during electro-catalytic reactions**

Speaker:

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Place:

ISAS, Schwarzschildstraße 8, Room 218
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Monday, December 5, 2016 – 2 pm

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It is known that polarization optical methods can detect even sub-monolayer films. Moreover, it is known that quantitative information's about such surface modifications are obtainable. This analytic potential, however, is mainly used until now to investigate and monitor surfaces in vacuum and gas phase environments. In liquids most of the investigations are dedicated to comparatively thicker films. In prove of principle experiments, we have recently used spectroscopic ellipsometry in electrochemical environment in order to study the sub-monolayer adsorption of halide ions and oxide on single crystal copper surfaces. These experiments clearly demonstrate the sensitivity regarding surface modifications as well as quantitative agreements with EC-STM concerning the amount of adsorbate ions. Furthermore it could be demonstrated that different surface orientation could yield in different chemical properties. Based on these findings, we could determine now quantitatively the hydrogen adsorption and the charge accumulation during the surface electro-catalytic reduction of hydrogen at different copper surfaces. A comparison with the hydrogen conversion rate, which was measured within cyclic voltammetry, shows once more the influence of the surface orientation and morphology.