



Institut für Physik
Institut für Chemie und Biotechnik



INSTITUTSKOLLOQUIUM

Gemeinsames Kolloquium der Physik und Chemie

Am Dienstag, dem 14. Mai 2024, spricht um 17:15 Uhr im Faraday-Hörsaal,

Dr. Christoph Corbet
Center for Surface- and Nanoanalytics (ZONA)
Johannes Kepler Universität Linz

zum Thema:

„In-Situ Optical Investigation of Electrochemically Controlled Surfaces and Thin Films“

Abstract:

The applied electrical potential between an electrolyte and a solid electrode, whether it is a metal, semiconductor, polymer or a bio-membrane, could initiate versatile surface or film modifications. First of all, the potential simply redistribute charges. But in the new thermodynamic equilibrium adsorbates or even the conformational appearance could change and thus determine the catalytic efficiency of an electrode material, for example. From an experimental point of view, the interfacial electric potential is, on the other hand, a very precise and powerful tool to manipulate thermodynamic equilibrium conditions. It can be modified over a huge range of several eV. Similar effects are otherwise only possible with extreme e.g. temperatures or pressures. However, the fundamental knowledge about the atomic structure and the related processes is still relatively limited compared to classical surface science in vacuum. The reasons are theoretical challenges in the description but primarily experimental limitations as electron based methods like XPS are not applicable at solid-liquid interfaces. Motivated by the increasing interests in this topic, we have started to use optical polarization methods such as spectroscopic ellipsometry (SE) and reflection anisotropy spectroscopy (RAS) to obtain new and complementary in-situ information. From experiments in vacuum or gas phase environment it is known that these methods could provide an exceptional surface sensitivity. This sensitivity allows us to observe the formation of surface quantum well states at a metal-electrolyte interface or an in-situ determination of the electronic band banding at semiconductor surfaces like the polar ZnO [0001] and [000-1] surface. As a third examples we could show the electrochemical doping and formation of polarons in polymers.

Wir laden Sie zu diesem Kolloquium herzlich ein!

Die Hochschullehrer der Institute für Physik und Chemie