IAP Seminar

Tuesday, 27th Oct. 2020, 16:00 s.t.
The seminar will be held as a Zoom Meeting
https://us02web.zoom.us/j/83082560515?pwd=NHFrQkRpQ1ZyU0pBeU5OcWIFN0FBQT09
Meeting ID: 830 8256 0515
Passcode: 413261

Dominik Dworschak

Institute of Applied Physics
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Photocorrosion of ZnO single crystals during electrochemical water splitting

Degradation and dissolution of transparent semiconducting oxides is central to designing of catalysts and catalysis conditions. In particular, photocorrosion can be significant and plays a central role during photoelectrochemical activity. Here, we utilize an electrochemical flow-cell combined with inductively-coupled plasma mass spectrometer (ICP-MS) to enable the in-situ study of time-resolved dissolution of zinc under simultaneous radiation of UV-light. We study the dissolution of zinc oxide single crystals with (0001) and (10-10) orientations. At acidic and alkaline pH we characterized potential dependent dissolution rates into both the oxygen and the hydrogen evolving conditions. A significant influence of the UV radiation and the pH of the electrolyte was observed. The dissolution behavior agrees well with the surface chemistry and stabilization mechanism of ZnO surfaces. Our data demonstrates that fundamental understanding of surface chemistry provides an effective path to rendering electroactive surfaces stable under operating conditions.

Valentina Wieser

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Direct quantitative measurements of MHC class II and CD4 interaction using a three-layer interferometer equipped Surface Forces Apparatus

The interaction of the co-factor Cluster of Differentiation 4 (CD4) and the class II Major Histocompatibility Complex (MHC) is known as the key specific protein-protein interaction that assists in antigen recognition of the human immune system. So far only cell adhesion assays and measurements with synthetic model peptides where used to qualitatively characterize CD4/MHC(II) interaction. In this research we present a direct quantitative force probing of the specific molecule-molecule interaction process using a surface force apparatus (SFA). We measured the unbinding forces and the interaction range of MHC(II)-CD4 interaction pairs. Our data suggests a binding energy in the typical range of specific interactions, and sheds new light on understanding the role of CD4 in antigen recognition. In addition, the newly developed methodical advances provide a direct quantitative assessment of protein-protein interaction with complex native proteins, using small amounts of material.

All interested colleagues are welcome to this seminar lecture(s) (2 x 20 min. presentations followed by discussion)

Friedrich Aumayr
(LVA-Leiter)

Markus Valtiner
(Seminar Chair)