TECHNISCHE UNIVERSITÄT CHEMNITZ

PHYSIKALISCHES KOLLOQUIUM

Mittwoch, 14.5.2014, um **16:00 Uhr**

Ort: Reichenhainer Str. 90; Neues Hörsaalgebäude, Raum: 2/N013

Prof. Dr. Hans-Peter Steinrück
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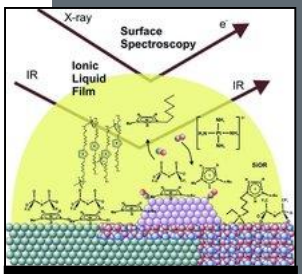
Surface Science of Complex Molecular Systems

Chemical reactions on surfaces can be followed in detail using X-ray photoelectron spectroscopy (XPS or ESCA). From the binding energies of the adsorbate and substrate core levels, detailed information on the chemical composition, chemical state (e.g. oxidation state), adsorption sites, but also on the photoemission process itself can be derived. Different examples will be addressed. The first deals with the **oxidation of sulphur** on stepped platinum surfaces, exemplifying the important role of steps in catalytic reactions [1,2]. The second addresses the adsorption of **metallopor-phyrins on metal surfaces** and their interaction with small molecules [3-5]. In particular we focus on the synthesis of metalloporphyrin monolayers by direct metalation of porphyrin monolayers, the chemical interaction with the metal surface and attachment of axial ligands on the central metal ion of the metalloporphyrin. The third example is the characterization and modification of the **surface properties of ionic liquids** [6-8]. Due to their low vapor pressure the full arsenal of UHV-based surface science methods can be applied to investigate this material class and detailed information can be derived. Particular emphasis will be given on surface and interface properties of several imidazolium-based ionic liquids, including the surface composition of non-functionalized hydrophobic ILs and PEG-functionalized hydrophilic ILs, in-situ reaction monitoring, the growth behaviour and the properties of ultrathin IL layers on various substrates, and the properties of dissolved catalyst complexes.



Surface Science and Model Catalysis with Ionic Liquid-Modified Materials

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[2] C. Papp and H.-P. Steinrück, Surface Science Reports 68 (2013) 446-487.
[3] W. Hieringer, K. Flechtner, A. Kretschmann, K. Seufert, W. Auwärter, J.V. Barth, A. Görling, H.-P. Steinrück, J. M. Gottfried, J. Am. Chem. Soc. 133 (2011) 6206-6222.
[4] S. Ditze, M. Stark, M. Drost, F. Buchner, H.-P. Steinrück, H. Marbach, Angew. Chem. Int. Edition 51 (2012) 10898–10901.
[5] M. Röckert, S. Ditze, M. Stark, J. Xiao, H.-P. Steinrück, H. Marbach, O. Lytken, J. Phys. Chem. C 118 (2014) 1661-1667.
[6] H.-P. Steinrück, Phys. Chem. Chem. Phys. 14 (2012) 5010-5029
[7] C. Kolbeck, I. Niedermaier, N. Taccardi, P. S. Schulz, F. Maier, P. Wasserscheid, H.-P. Steinrück, Angew. Cem. Int. Ed. 51 (2012) 2610-2613
[8] I. Niedermaier, M. Bahlmann, C. Papp, C. Kolbeck, W. Wei, S.Krick Calderón, M. Grabau, P. S. Schulz, P. Wasserscheid, H.-P. Steinrück, F. Maier, J. Am. Chem. Soc. 136 (2014) 436-441.

Alle Zuhörer sind ab 15:45 Uhr zum Kaffee vor dem Hörsaal eingeladen.

Informationen zum Vortrag erteilt Prof. Dr. Michael Hietschold, Tel.: 0371 531 33203