



MAX-PLANCK-GESELLSCHAFT



ACS Fall Meeting 2012, Symposium: Spectroscopy and Microscopy in Catalysis: In-Situ Age
Philadelphia, 19.08.-23.08.2012

Adding dynamic to electron spectroscopy: Evolution of active catalyst surfaces studied by *in-situ* X-ray photoelectron spectroscopy and soft X-ray absorption spectroscopy

The surface of functional materials like catalysts responds to the ambient conditions. Surface sensitive *in situ* spectroscopy, i.e. in the presence of a reactive gas allows studying the formation of the gas/solid interface of a catalyst with time and thus adds a dynamic dimension to the spectroscopic characterization. The ISS facility operated by the FHI at the synchrotron radiation source BESSY II of the HZB is dedicated to this kind of *in situ* studies [1, 2]. Online gas analytics are included in the set-up to facilitate a correlation of the electronic surface structure with the catalytic performance. Examples for the dynamic formation of the electronic surface structure by interaction with the ambient gas under equilibrium will be presented covering both model systems and technical catalysts like multi-element mixed oxide (MoVTaNbOx) powders.

An outlook on future activities at HZB/BESSY to develop further synchrotron based ambient pressure characterization methodologies will be given.

References

1. A. Knop-Gericke et al., *Adv. Cat.* **52**, 213 (2009)
2. M. Salmeron and R. Schlögl, *Surf. Sci. Rep.*, **63**, 169 (2008)
3. T.C.R. Rocha et al., submitted to *Phys. Chem. Chem. Phys.* (2011)
4. M. Hävecker et al., accepted *J. Cat.* (2011)