IAP Seminar

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Tuesday, 11th June 2019, 16:00 s.t.
TU Wien, Institut für Angewandte Physik, E134
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Yellow Tower „B“, 5th floor, SEM.R. DB gelb 05 B

Chemical and Structural Properties of Highly Oxidized Metal Surfaces

Understanding the interaction of oxygen with transition metal surfaces is important in many areas including corrosion and catalysis. Of interest to us is the formation and chemistry of subsurface oxygen (O_{sub}); oxygen atoms dissolved in the near-surface region of catalytically active metals. To improve our understanding of this system, we use ultra-high vacuum (UHV) surface science techniques to characterize Ag and Rh surfaces after exposure to atomic oxygen (AO) to obtain O coverages in excess of 1 ML. Low-energy electron diffraction (LEED) and UHV Scanning Tunneling Microscopy (UHV-STM) characterize the various oxygenaceous structures produced, and we quantify the amount of oxygen with temperature programmed desorption (TPD). We have found that the surface temperature during deposition is an important factor for the formation of O_{sub} and the consequent surface structures. Finally, we have recently found that Rh surfaces are significantly more reactive towards CO oxidation when O_{sub} is present. This enhanced reactivity is located at the interface between the less reactive RhO_2 oxide and O-covered metallic Rh. These results reveal the conditions under which O_{sub} is formed and stable, and show that O_{sub} also leads to enhanced reactivity of oxidized metal surfaces.

All interested colleagues are welcome to this seminar lecture (45 min. presentation followed by discussion).

Friedrich Aumayr
(LVA-Leiter)

Gareth Parkinson
(Seminar Chair)