O 100: Overview Talk: Jürgen Behm

Time: Friday 13:15–14:00 Location: H15

Invited Talk O 100.1 Fri 13:15 H15

From UHV to Electrochemistry - Recent Developments — •R. Jürgen Behm — Institute of Surface Chemistry and Catalysis, Ulm University, D-89069 Ulm, Germany

Driven by the rapidly increasing role and importance of electrochemical Energy Technologies, e.g., in fuel cells, photovoltaics or batteries, electro-chemistry has emerged again as a highly active and rapidly growing field. The fundamental understanding of electrochemical processes is hampered, however, by the complex reaction conditions and the lack of established spectroscopic techniques. Similar to previous approaches in Heterogeneous Catalysis, Surface Science type model studies, both experimental and theoretical, have the potential to significantly contribute to a molecular-scale understanding of electrochemical and electrocatalytic reactions. These may reach from pure UHV studies on the chemical interaction between electrode and electrolyte via *ex situ* sample preparation and surface characterization under UHV conditions before / after exposure to electrochemical reaction conditions, which involves a controlled sample transfer between UHV and electrochemical cell, to finally *in situ* spectroscopic studies.

In the present talk I want to illustrate the potential of such kind of studies, using simple electrocatalytic reactions such as O_2 reduction or CO oxidation as example, but also other electrochemical processes. I will point out the close correlations and the validity of similar microscopic concepts for the description of reactions at the solid|gas and the solid|liquid interface, but also underline key differences. Finally, the importance of combined experimental and theoretical studies is demonstrated.