

O 53: Overview Talk: Olaf Magnussen

Time: Wednesday 9:30–10:15

Location: HE 101

Invited Talk

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Elementary steps in surface dynamics and reactivity at electrochemical interfaces — •OLAF MAGNUSSEN — Institute of Experimental and Applied Physics, Kiel University, Kiel, Germany

Processes at electrochemical interface are the key to many current and emerging technologies, e.g. in energy storage or micro- and nanofabrication. Detailed insights into these processes on the atomic scale can be obtained by fast in situ scanning tunneling microscopy (Video-STM) and novel synchrotron X-ray scattering techniques. These can provide data on the mechanisms and dynamics of adsorbate diffusion

and interactions on the electrode surface and of structural changes during electrochemical reactions, as shown here for selected examples. First, the diffusion of isolated anionic, cationic, and organic adsorbates on noble metal electrodes will be discussed, indicating a decisive role of coadsorbed anionic species. Specifically, coadsorbates can induce an inverted potential dependence, suggesting that they can change the diffusion mechanism. Second, results on Pt oxidation and Pt oxide reduction are presented, which reveal fundamental differences between different surface orientations. While on Pt(111) oxygen ingress into the Pt surface is initially fully reversible, it results in irreversible structural changes on Pt(100).