SYSR 3 Hauptvortrag

Zeit: Samstag 09:30–10:00 Raum: TU HE101

Hauptvortrag SYSR 3.1 Sa 09:30 TU HE101

In-situ High Pressure XPS of Heterogeneous Catalysts — •Robert Schlögl and Axel Knop-Gericke — Fritz-Haber-Institut der Max-Planck-Gesellschaft, Faradayweg 4-6, 14195 Berlin

Heterogeneous catalysts are dynamical systems that can be studies in their correct function only when subjected to appropriate reaction conditions taking into consideration the coupling between the catalyst structure and its reaction environment. Consequently we studied structural and catalytic properties simultaneously by applying in-situ methods and using synchrotron radiation. Facing a deficit in truly surface-sensitive in-situ- techniques in collaboration with the University of Berkeley we developed a high pressure XPS system allowing photoemission and photo absorption studies of all kinds of heterogeneous catalysts under flow-through conditions at pressures up to ca. 10 mbar. This and the tuneability of SR radiation allowing non-destructive depth profiling provide substantial information about the interaction of catalytic material with its reaction environment. Examples of studies on metals (Cu, Ag, Ru) and oxides (vanadium oxides, molybdates) are used to highlight the type of information that can be gathered. The data clearly show the metastable nature of the systems and their decomposition behaviour upon removal of the reaction conditions. It is shown that a new quality of insights into the function of catalyst is obtained by using SR-based in-situ XPS that is now mature enough for applications to complex practical systems.