



Physical Chemistry
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Functional Nanomaterials

Our research focusses on gaining a fundamental understanding of dynamic processes in functional nanomaterials. In heterogeneous catalysis, for example, the catalyst and support restructure continuously during a reaction. With movie-rate scanning tunneling microscopy (STM) at elevated temperatures, near-ambient pressures and in different reactive gas atmospheres, we follow dynamic processes directly to investigate systematically the formation and decay of highly reactive particle structures and how such restructuring influences reactivity. Synchrotron-based X-ray photoelectron spectroscopy is used to gain complementary information on chemical composition, oxidation and charge state. By using small size-selected metal clusters, we disentangle size effects and identify internally dynamic cluster sizes.

