

New opportunities in X-ray absorption spectroscopy: a catalyst and its dynamic structure

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Understanding a functioning catalyst requires understanding the interplay between reactant and intermediate with the catalytically active site. Because of the highly dynamic nature of the structure of the active site, in situ characterization is essential. I will present examples of how structural characterization aids the understanding of structure – performance relations. We continuously extend our characterization toolbox; I will describe the most recent opportunities and dwell upon the future direction. The dynamic structural change the platinum nano-particles as function of time and position within a single reactor will be described in CO oxidation under oscillating conditions. The dynamic structure of the palladium particles in semi-hydrogenation of alkynes will be described and the relation between palladium carbide formation and selectivity will be described.