



New methods and applications in time-resolved X-ray absorption spectroscopy

By Jan Stötzl

Shaker Verlag Mrz 2012, 2012. Buch. Book Condition: Neu. 211x149x15 mm. Neuware - Time-resolved investigations of condensed matter on an atomic scale level are nowadays indispensable to gain insights in the complex mechanisms of dynamic processes in physics and chemistry. Most of these processes take place at the surface of a metal, such as for example layer growth and corrosion phenomena or all catalytic applications. X-ray absorption spectroscopy is one of the most important investigation tools in this context. It allows resolving the local structure around a selected kind of element in the probed sample within the range of a few Angstroms by using the intense X-ray beams generated at modern synchrotron radiation sources. It is thus perfectly adapted to investigate systems with only a short range order as for example very thin layers or nanoparticles which are especially important for catalytic applications. Prerequisite for X-ray absorption spectroscopy are monochromators with perfect crystals that reflect only a certain energy determined by the incident angle. Time-resolutions of down to a few milliseconds for one spectrum are achievable with quick-scanning X-ray absorption spectroscopy (QEXAFS) using mechanics to rapidly oscillate the monochromator crystals. New technical approaches for the QEXAFS method are presented in...



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