

Real time observation of chemical reactions on surfaces

Initiative: Forschung mit Freie-Elektronen-Lasern: Peter Paul Ewald-Fellowships am LCLS in Stanford

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The chemistry on surfaces governs the larger fraction of the industrially relevant chemical processes and is a key ingredient to solve modern challenges for the society, like the production of fuels in an eco-friendly way and the cleaning of exhaust gases from combustion processes. Nevertheless, the details of the electronic structure during reactions on surfaces are still unknown. The new hard X-ray free-electron lasers provide a unique tool to study the formation and breaking of bonds after the reaction has been induced by specific excitations. During the fellowship the formation of a chemical bond in real time is studied for the first time by measuring changes in the electronic structure. As example reaction the catalytic oxidation of carbonmonoxide will be used. In a secondary project, the new opportunities of the Terahertz source at LCLS will be exploited to induce novel ultrafast chemical processes on surfaces.

Projektbeteiligte

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