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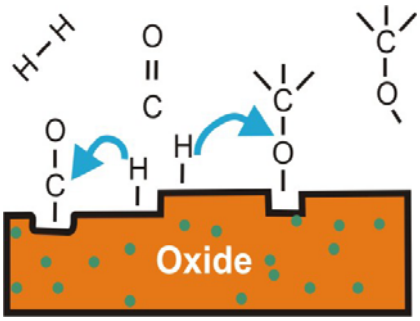

SFB 558
„Metall-Substrat-Wechselwirkungen in der heterogenen Katalyse“

Einladung
zum Vortrag von

Prof. Dr. Michael Reichling
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(Gast von Prof. Wöll/Dr. Wang)

“Surface structure and defects of CeO_2(111)”

Cerium dioxide (ceria) is a material that is widely used for catalytic applications. It is used in the 3-way catalytic converter known from automotive technology and holds substantial promise in other diverse research areas like solid-fuel cell technology for the production of hydrogen. In this context, ceria acts as an oxygen buffer as well as promoting noble-metal catalytic activity. This important capability for storing and releasing oxygen is believed to be the result of the rapid formation and elimination of oxygen vacancy defects. Therefore, defects at slightly and strongly reduced CeO_2, specifically on the thermodynamically most stable (111) surfaces are of great interest as they may be the key to understanding surface chemistry on ceria.
To reveal and identify surface and sub-surface defects on CeO_2(111), we apply dynamic scanning force microscopy (NC-AFM) providing highest resolution images of the surface structure and its irregularities. For the identification of defects, the detailed atomic structures of features found in experiments is related to predictions from DFT calculations on relevant surface defects. In this way, we are able to identify surface and sub-surface vacancies, surface hydroxide and Ce^{3+} ions. Furthermore, we demonstrate that water readily adsorbs at the surface at room temperature but my diffuse and cluster on terraces as well as step edges. Individual water molecules can also be laterally manipulated by the tip of the force microscope with atomic precision.

Termin:	**12.05.2009**
Zeit:	**11.15 h**
Ort:	**HNC 5/99**

Gäste sind herzlich willkommen.