FOXSI
Functional Oxide Surfaces and Interfaces

EINLADUNG

zum Vortrag
von

MSc Joong Il Choi

TU Wien, Institute of Applied Physics (IAP)
Austria

Ultrathin ZrO_2: surface structure is decisive for oxide properties

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Abstract:

Although zirconia (ZrO_2) finds a wide range of applications in engineering, catalysis, microelectronics and solid oxide fuel cells (SOFCs), atomic-level studies of its surface structure are difficult due to its insulating nature, related to its high band gap ($E_g \approx 5$ eV). In order to overcome this limitation, ultrathin zirconia films were grown by oxidation of Zr-based alloys (Pt_3Zr [1] and Pd_3Zr [2]), and the structure of these films was studied by STM. In this talk, I will present atomically resolved STM measurements of the films and the adsorption of H_2O and atomic H as well as deposition of metals (Ag, Au, Pd, Ni, Fe) at these surfaces. Combined studies by STM and DFT reveals that the surface structure of the ultrathin oxide is a decisive factor that determines the interaction of the oxide with the molecules and the metals.

[1] Antlanger et al., Phys. Rev. B 86, 035451 (2012).
[2] Choi et al., J. Phys.: Condens. Matter 26, 225003 (2014).

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Prof. Günther Rupprechter (Speaker), Melanie Schärer (SFB FOXSI Secretary)
Vienna University of Technology, Institute of Materials Chemistry, 1060 Vienna, Getreidemarkt 9, Austria
Tel.:+43-(0)1 58801-165102 - Fax: +43-(0)1 58801-16599
e-mail: grupp@imc.tuwien.ac.at, e-mail: melanie.schaerer@tuwien.ac.at
web: http://foxsi.tuwien.ac.at/