TECHNISCHE UNIVERSITÄT WIEN

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IAP-SEMINAR

ANNOUNCEMENT

Date: **Tuesday, 28.6.2016**
Time: **16:00 p.m.**
Location: **Technische Universität Wien, Institut für Angewandte Physik, E134**
yellow tower „B“, 5th floor, Sem.R. DB gelb 05 B (room number DB05L03), 1040 Wien, Wiedner Hauptstraße 8-10

Lecturer: **MSc Oscar Alberto Gamba Vasquez**
TU Wien, IAP

Subject: **Surface Chemistry of Magnetite**

Abstract:
Understanding the interaction of metal oxides surfaces with organic molecules is a crucial aspect in research topics such as catalysis, and environmental science. Formic acid (HCOOH) and methanol (CH_3OH) are often used as probe molecules to test the reactivity of metal oxide surfaces. Adsorption of both species can be molecular, as in the low temperature regime, but is frequently dissociative on surfaces that expose coordinatively unsaturated cation/anion pairs in close proximity
In this talk, the study of adsorption of formic acid and methanol on the magnetite (Fe_3O_4) surface (a naturally abundant oxide material with high impact as catalyst in different process as such the water gas shift reaction) using X-ray photoelectron spectroscopy, infrared reflection adsorption, temperature programmed desorption and scanning tunneling microscopy will be described. On the Fe_3O_4 (001) surface, both molecules adsorb molecularly at low temperature, and dissociatively at room temperature, yielding adsorbed formate and methoxy species respectively, together with surface hydroxyl groups.
Formic acid adsorbs as formate in a bidentate configuration at regular iron lattice sites producing a (1×1) over-layer, facilitated by the close proximity of under-coordinated Fe^{3+}/ O^{2-} cation/anion pairs, while methanol adsorption is restricted at surface defects sites, which are identified as step edges, iron adatoms, anti-phase domain boundaries and Fe atoms incorporated in the subsurface.

All interested colleagues are welcome to this seminar lecture
(45 minutes presentation followed by discussion).

U. Diebold e.h.
(Seminar-Chairperson)

H. Störi e.h.
(LVA-Leiter)