



Seminar

gemeinsam

mit dem Internationalen Graduiertenkolleg (IRTG) „Diffusion in Porous Materials“

Am Dienstag, dem 17. Januar 2012, spricht um 13.30 Uhr im Seminarraum 224 der
Fakultät für Physik und Geowissenschaften, Linnéstraße 5, 04103 Leipzig,

Herr Prof. Dr. Dirk Volkmer

Institut für Physik, Universität Augsburg

zum Thema

Towards Catalytically Active Metal-Organic Frameworks

Porous, redox-active metal-organic frameworks (MOFs) will be presented which are constructed from aromatic *N*-donor ligands (e.g. pyrazolate or triazolate moieties) and open-shell 3d transition metal ions. Previous investigations have demonstrated that the use of heterocyclic aromatic *N*-donors leads to greatly enhanced hydrolytic stability of the MOF compounds, which is a necessary condition for catalytic oxidation processes. [1] Particular attention will be addressed to the specific advantages of embedding a multinuclear transition metal cluster into a rigid 3D coordination framework (“entatic state catalyst”). [2] Thus, the spectroscopic and catalytic properties of solid MOF catalysts will be compared with special emphasis laid upon gas phase reactions. Quantum chemical investigations address different oxidation states of the electronically coupled metal sites in multinuclear clusters, and their role in catalytic oxidation or oxygenation cycles.

Selected References:

[1] Heterogeneous Catalytic Oxidation by MFU-1: A Cobalt(II)-Containing Metal-Organic Framework
M. Tonigold, Y. Lu, B. Bredenkötter, B. Rieger, S. Bahnmüller, J. Hitzbleck, G. Langstein, D. Volkmer,
Angew. Chem. Int. Ed. Engl. 2009, 48, 7546–7550.

[2] Pyrazolate-Based Cobalt(II)-Containing Metal-Organic Frameworks in Heterogeneous Catalytic Oxidation
Reactions: Elucidating the Role of Entatic States for Biomimetic Oxidation Processes
M. Tonigold, Y. Lu, A. Mavrandonakis, A. Puls, R. Staudt, J. Möllmer, J. Sauer, D. Volkmer
Chem. Eur. J. 2011, 17, 8671-8695.

Alle Interessenten sind dazu herzlich eingeladen.

Prof. Dr. Roger Gläser

Sprecher der IRTG „Diffusion in Porous Materials“

Direktor Institut für Technische Chemie