Current group

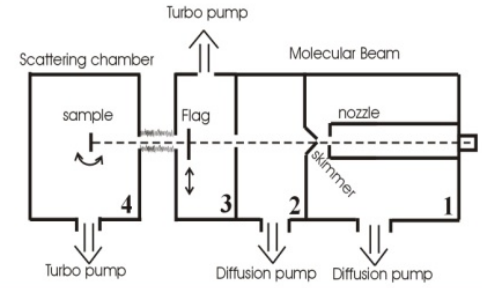
A. Chakradhar
M. Komarneni
Dr. J. Shan

Uwe Burghaus

Dr. Uwe Burghaus
Associate Professor - Surface Chemistry
Department of Chemistry and Molecular Biology
NDSU Dept. 2735, PO Box 6050, Fargo,
ND 58108-6050, USA

For DHL, FedEx and UPS deliveries, please use:
Department of Chemistry and Molecular Biology,
NDSU Ladd Hall 208, 1231 Albrecht Blvd, Fargo,
ND 58102, USA

Phone 701-231-9742 FAX 701-231-8831
Email Uwe.Burghaus@ndsu.edu
www.ndsu.edu/chemistry h ttp://www.uweburghaus.us

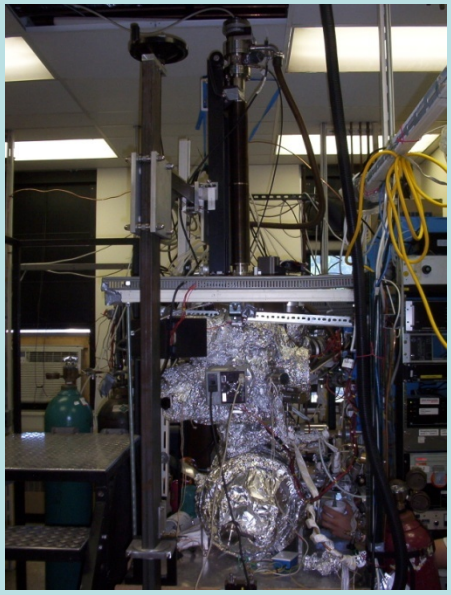


Adsorption/reaction dynamics: The workhorse of our group is this molecular beam scattering system, it's a kind of LASER but we use beams of "real" particles (He, alkanes, water, alcohols, CO, NO, CO_2, etc..). We just could upgrade the system by an XPS spectrometer and larger pumps.

Kinetics: The cover figure (on the right) shows an ultra-high vacuum kinetics system which has just been upgraded with a new preparation chamber.

Surface Nano Materials Chemistry

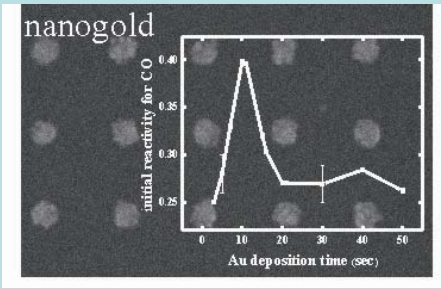
http://ndsu.edu/chemistry



U. Burghaus
Department of Chemistry
& Molecular Biology
North Dakota State University

2011

Model Array Nano Catalysts



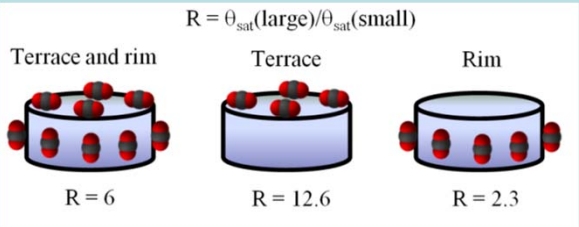
Model nano array catalysts consist of a predetermined structure of nanometal dots with perfect control over their morphology which is pertinent for model studies. This project is a collaboration with national labs in Berkeley and Argonne/Chicago. Electron beam lithography is used to manufacture the samples.

e.g. J. Mol. Catal. A: Chemical **321 (2010) 101**

(NSF CAREER)

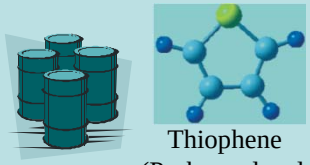
Cu cluster on silica

We could pinpoint the active sites on this catalyst using electron beam lithography and molecular beam scattering.

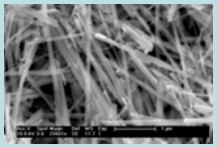


CO_2 adsorbs primarily along the rim of copper oxide clusters.

(NSF CAREER)

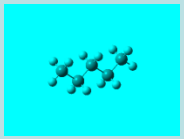


Thiophene
(Probe molecule)

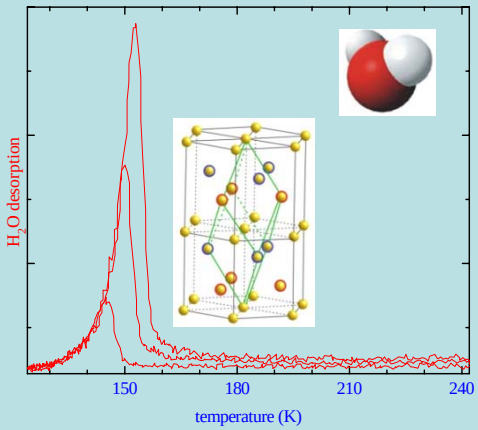


WS_2 NT catalyst
(from R. Tenne)

hydrodesulfurization



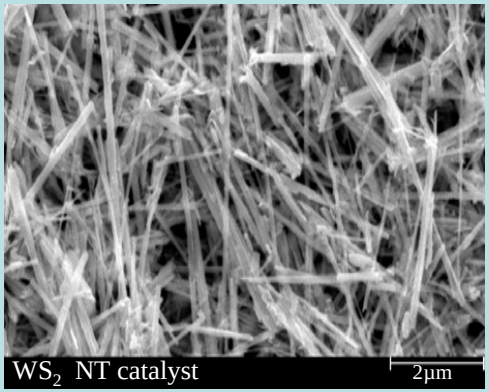
Hydrophobic surfaces



Unusual systems show unusual properties: water does not like to adsorb on antimony, i.e. only a condensed layer is formed. *(DoE)*

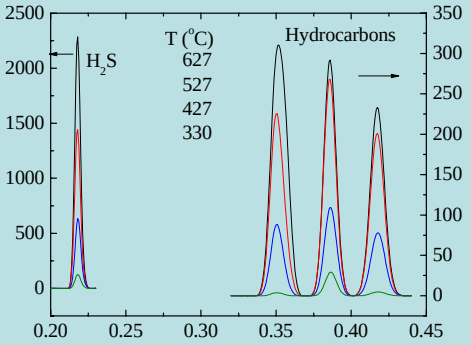
Chem. Phys. Lett., 517 (2011) 46-50

WS_2 NT – Tungstendisulfide nanotubes to clean up fuel



Shown here is another example of inorganic nanotubes which may belong to the next generation of hydrodesulfurization (HDS) catalysts. Thus, sulfur contaminations will be chemically transformed into alkanes. We collaborate with R. Tenne (Israel) on this project. (DoE)

e.g. Catal Letters 129 (2009) 66; 125 (2008) 236



Experiments on powders at ambient pressure are combined with ultra-high vacuum surface chemistry studies. Shown is a GC trace of HDS catalysts.

Current funding DoE-EPSCoR state grant, NSF-CAREER