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Vortragsankündigung

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Es spricht: **Prof. Dr. D. Wayne Goodman,** Department of Chemistry, Texas A&M University, Tamu, USA

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Ort: **Fritz-Haber-Institut der MPG Berlin**
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Gebäude P
Raum P 2.06

Thema: **Catalysis by Gold-Palladium Alloys: The Role of Isolated Palladium Sites**

Abstract: A AuPd(100) single crystal model catalyst, suitable for studying surface segregation and structure-reactivity relationships, was used to study CO-O2 and CO-NO reactions at CO pressures of ~0.01 atm. For the CO-O2 reaction, exceedingly high CO2 formation rates, e.g., 103 times higher than Pd single crystals at 450 K under the same reaction conditions, was discovered. This reactivity is attributed to the significantly reduced CO binding energy (< 84 kJ/mol compared with ~150 kJ/mol on Pd single crystals) such that CO-inhibition of reaction is greatly reduced. In situ polarization-modulation infrared reflection absorption spectroscopy (PM-IRAS), coupled with reaction kinetic measurements, also reveal that O2 dissociation occurs exclusively on surface contiguous Pd sites, demonstrating that these sites are indispensable for CO oxidation. The CO-NO reaction was also found to proceed promptly below ~500 K, temperatures at which (supported) Pt-groups metals marginally catalyze this reaction. These results demonstrate the unusual ability of Au-Pd alloys to dissociate NO. Moreover, a AuPd(100) surface catalyzes the CO-NO reaction with exceedingly high N2 selectivity, presumably due to the low NO(ads) coverage under reaction conditions, discovered using in situ PM-IRAS. These studies confirm that Au-Pd alloys are promising catalysts for emission control, especially during low-temperature operation.

Organisator: Prof. Dr. H.-J. Freund (FHI)

Gäste sind herzlich willkommen!

Prof. Dr. Matthias Drieß
Sprecher des Exzellenz-Clusters UniCat