Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Faceting of Ru($11\bar{2}0$) Surface: A Model System for Catalysis[1] QUANTONG SHEN[2], WENHUA CHEN[3], HAO WANG[4], ROBERT BARTYNSKI[5], Rutgers University, PROFESSOR ROBERT A. BARTYNSKI TEAM — We have studied NO_2-induced faceting of a Ru($11\bar{2}0$) surface by means of low energy electron diffraction (LEED), scanning tunneling microscopy (STM), and Auger electron spectroscopy (AES). By annealing the sample at $>$ 600 K in NO_2 (10^{-8} Torr), the surface becomes fully faceted as revealed by LEED although it is rather smooth, with only two layers exposed. The faceted surface remains the same at NO_2 exposure ranging from 20 L to 12000 L and is stable for substrate temperature T $<$ 850 K.The STM results confirmed the LEED observations and showed that the faceted surface consists of sawtooth ridges along the [0001] direction with typical dimensions of $\sim$5 nm in width and $>$ 100nm in length. We have found that the faceted O/Ru surface is very active for NH_3 decomposition to produce H_2 with high selectivity to N_2 at room temperature.

[1]This work is supported by the U. S. Department of Energy, Office of Basic Energy Sciences
[2]postdoc
[3]Research associate
[4]PhD student
[5]Professor

Quantong Shen
Rutgers University

Date submitted: 21 Nov 2008 Electronic form version 1.4