Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

**Can isolated Au nanoclusters catalyze CO oxidation?**[1] P.-S. LIN, A.-L. CHIN, C.-P. CHANG, F.-K. MEN, Department of Physics, National Chung Cheng University, Chia-Yi, Taiwan, R.O.C. — It has been more than twenty years since the discovery of oxide-layer supported Au nanoclusters (<5 nm) capable of catalyzing CO oxidation. This discovery has attracted a lot of attention owing to possible practical applications as well as a model system for understanding nanoscale catalysis. One mechanism that has been proposed to explain this observation is that the process takes place entirely on Au nanoclusters. Since most experiments performed on this topic have been done in complicated environments, it would be difficult to fully justify/dismiss the validity of a particular mechanism. We have chosen a clean and inert support, highly oriented pyrolytic graphite, to grow Au nanoclusters via molecular beam epitaxy under ultrahigh vacuum conditions. We measured the change in $CO_2$ partial pressure after leaking high-purity CO and $O_2$ gases into the vacuum chamber with and without the presence of Au nanoclusters. To perform a systematic investigation, we also prepared Au nanoclusters of different densities and sizes. With the presence of Au nanoclusters we could not find any discernible increase in the $CO_2$ partial pressure, thus rules out the possibility that Au nanoclusters would take a full credit in catalyzing CO oxidation.

[1]Supported by NSC of Taiwan, R.O.C.

Fu-Kwo Men
Department of Physics, National Chung Cheng University

Date submitted: 21 Nov 2008 Electronic form version 1.4