

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**An XPS study of gas phase interaction with Au nanoparticles coated TiO<sub>2</sub> nanosprings**<sup>1</sup> I. NIRAULA, B.A. FOUETIO, D.N. MCILROY, Dept. of Physics, Univ. of Idaho, Moscow, ID 83844, T. TURBA, M.G. NORTON, School of Mech. and Mat. Eng., Washington St. Univ., Pullman, WA 99164 — The interaction of CO and O<sub>2</sub> on the surface of the Au nanoparticles (NPs) supported on TiO<sub>2</sub>(Au/TiO<sub>2</sub>) nanosprings (NS) by x-ray photoelectron spectroscopy will be discussed. The Au NPs were coated onto the TiO<sub>2</sub>NS by plasma enhanced chemical vapor deposition, where the average particle size is 7-8 nm. The gas interactions with the Au NPs is evaluated by examining binding energy shifts of the Au 4f, C 1s, Ti 2p and O 1s electron core level states. For both of the gases, all of the core levels shifted to higher binding energy. Temperature dependent desorption, or the lack thereof, as determined by XPS analysis, indicates that the gas-substrate interaction is chemisorption, as opposed to physisorption. A detailed discussion on the mechanism of adsorption, as well as the roles of the Au NP and the TiO<sub>2</sub> substrate, will be presented.

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Date submitted: 17 Nov 2010

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