**307c Nanogold Particle-Oxide Interaction for the Water Gas Shift Reaction**

*Danny Pierre, Maria Flytzani-Stephanopoulos, Mark E. Bussell, Weiling Deng, and Gajanthan Balakaneshan*

The importance of nanogold–oxide interaction for CO oxidation reactions has been discussed extensively in the literature. For the water-gas shift (WGS) reaction, our group has shown that there is a strong interaction between gold and cerium oxide. The presence of gold ions on the defect sites of ceria is a key feature of Au-ceria catalysts [1-3]. The importance of metallic gold nanoparticles has also been argued in the literature [4]. Conventional techniques such as co-precipitation, deposition-precipitation, and cogelation are typically used to prepare these catalysts.

Recently the use of reverse micellar systems has been reexamined due to their ability to make highly structured uniform catalysts [5]. The technique has already been used to make both encapsulated Pt and Pd catalysts for butane combustion [6]. In this work, we look at several nano gold-oxide materials; namely $Au/SiO_2$, $Au/CeO_2$-doped $SiO_2$, and $Au/Fe_2O_3$ for the WGS reaction. Materials included encapsulated gold within a shell of oxide (via the reverse micelle technique) and traditionally structured catalysts. The catalysts were characterized by high-resolution transmission electron microscopy (HRTEM), X-ray diffraction (XRD), BET surface area and $H_2S$ temperature-programmed desorption (TPD) measurements, as well as by $H_2$ and CO temperature-programmed reduction (TPR). Catalyst activities were evaluated for the WGS reaction under various conditions that included product-free and full reformate gas mixtures, as well as in the presence and absence of ppm levels of $H_2S$ to investigate the effects of poisons.

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