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**Adsorption of Bromine on Gold Nanoclusters**[1] CHRISTOPHER SALVO, JOSIAH KEAGY, JORY YARMOFF, University of California Riverside
— Small metal nanoclusters are extremely effective as catalysts, with rates that rival those of enzymes in biological systems. The first step in a catalytic reaction is the adsorption of a precursor molecule. The neutralization of alkali projectiles during low energy ion scattering (LEIS), which is acutely sensitive to the local electrostatic potential a few Å's above the surface, is used here to probe Au nanoclusters grown on $SiO_2$ as they are reacted with $Br_2$. Previous work had demonstrated very efficient neutralization in scattering from small catalytically active Au clusters, which was interpreted as an indication that the bare clusters are negatively charged. X-ray photoelectron spectroscopy and LEIS show little or no Br signal after exposing $SiO_2$ and Au foil to $Br_2$, suggesting that adsorption does not occur because the Br-Br bond does not break. Dissociative adsorption occurs rapidly, however, when small Au nanoclusters are reacted with $Br_2$. 1.5 keV $Na^+$ ions scattered from the Au clusters show a decrease in the neutralization probability as Br is reacted, indicating that adsorption results in charge being transferred from the cluster to the Br adatom.

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