SURFACE-ENHANCED PHOTOCHEMISTRY OF P-NITROBENZOIC ACID ON AG COATED AU COLLOIDAL METAL FILMS AT 633 NM.

B. D. GILBERT, *Linfield College, Department of Chemistry, 900 SE. Baker St., McMinnville, Oregon 97128*; J. MIRKOVIC, *George Harrison Spectroscopy Laboratory, Massachusetts Institute of Technology, Cambridge, Massachusetts, 02139-4307*; D. K. LAKER, *3614 Mandavilla Way, Apex, North Carolina 27502*.

Surface enhanced Raman scattering (SERS) was used to probe the 633 nm photoreduction of *p*-nitrobenzoic acid (PNBA) to azodibenzoate on Ag and Ag coated Au colloidal metal films. The variation of the photolysis rate was determined by monitoring the growth of the $1470 cm^{-1}$ N=N stretch of the photoproduct (azodibenzoate) compared with the $1600 cm^{-1}$ aromatic quadrant stretch of the PNBA. The rate was determined from the ratio of the $1470 cm^{-1}$ band to the $1600 cm^{-1}$ band as a function of time. The rate was found to be much larger on bare Ag colloidal metal films than on Ag coated Au colloidal metal films, and to decrease as a function of the Ag coverage. These changes in the observed photoreduction rate are consistent with an electromagnetic enhancement mechanism.