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Photo-formation of Gold Nanoparticles in Au(III)-chitosan-silica aerogels: Dependence on Wavelength and Duration of Exposure¹ NARAYANAN KUTHIRUMMAL, ADAM DEAN, RICHARD SMITH, ALEM TEKLU, College of Charleston — Porous transparent monoliths of Au(III)-chitosansilica aerogels have been exposed to UV light (320 nm and 207 nm). The photoacoustic spectra of UV-exposed sample revealed a new peak around 526 nm, which corresponded to the plasmon resonance band of gold nanoparticles. Scanning electron microscopic and elemental analysis revealed the presence of gold particles. The plasmon peak is found to shift significantly to the blue side upon irradiating the sample for a longer time interval. It is possible that the nanoparticle heats a bit and could anneal its surface surrounding leading to a slight reduction in size. Electron microscopic observations show morphological changes upon increasing the UV exposure time. A relatively larger shift is observed upon exposing the sample to 200 nm light. Based on the present results, it is concluded that the gold particle size can be altered by changing the duration of light exposure or by using a different wavelength.

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