

Abstract Submitted
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Kinetics of Gold Nanoparticle Formation¹ ASHLEY CETNAR, Grove City College, SREERAM CINGARAPU, KENNETH KLABUNDE, Kansas State University — My objective was to understand the chemical details of an important method of producing monodisperse nanoparticles. The nanoparticles synthesized are gold ligated by thiol ligands. The nanoparticles average 5 nanometers in diameter with about 5000 gold atoms and 600 thiol ligands per particle. The two methods used to prepare the particles are the solvated metal atom dispersion method and the inverse micelle method. Both processes break the gold into nanoparticles and are ligated to protect the particles from aggregation. After the nanoparticles are produced they are made monodisperse by digestive ripening. Digestive ripening occurs when the polydispersed product is refluxed over time. During this illusive procedure the multi-sized particles all become uniform in size. During reflux, the samples are analyzed by UV spectroscopy. The spectroscopy reveals a plasmon emitted from the nanoparticles at 530 nm from a standard sample of 1:30 gold to ligand ratio. During the reflux procedure, the gold Plasmon peak narrows and the peak becomes steeper. Over time, the peak of the Plasmon seems to be red shifted. As the amount of ligand was varied the gold plasmon appeared to shift.

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