

A comparison of different coatings agents for gold nanoparticles obtained with a one-pot reaction with ascorbic acid

Reference	Presenter	Authors (Institution)	Abstract
01-048	Maria Elisa Chuery Martins Rostelato	Nogueira, B.R. (Instituto de Pesquisas Energéticas e Nucleares); Souza, C.D. (Instituto de Pesquisas Energéticas e Nucleares); Carvalho, D.V. (Instituto de Pesquisas Energéticas e Nucleares); Rostelato, M.E. (Instituto de Pesquisas Energéticas e Nucleares); Rosero, W.A. (Instituto de Pesquisas Energéticas e Nucleares);	<p>The materials at nanometric size sometimes present different characteristics when compared to the same material in macrometric scale. The gold nanoparticles (AuNPs) are an example, presenting different properties such as fluorescence, melting point, electrical conductivity, magnetic permeability, chemical reactivity, and even different color than usual. Those features are direct dependence on particle size, shape, and colloidal distribution. AuNPs have desirable attributes for medical applications such as excellent biocompatibility, low toxicity, and good optical and electronic properties. AuNPs are already widely used to carry nucleotides, antibodies, and proteins in addition to biotech applications. Spherical gold nanoparticles are mainly processed by Au³⁺ reduction to Au⁺ and Au⁰. With the use of a stabilizing ligand, the gold nanoparticles are capped and then further growth is avoided. In this work for each 100 mL of a 0.5 mM HAuCl₄, 1 mL of 0.1 M L-Ascorbic Acid solution was added, as reduction agent, under a vigorous and constantly magnetic stirring at room temperature. Almost instantly, the reaction that was originally transparent, became black and then reddish, after continued stirring for 30 min more. Three different coating agents were used in this work (SH-PEG-NH₂, Arabic Gum, and Biotin). A solution with 0.1 mM of each coating agent was prepared and then in a proportion of 1:1 they were added to the AuNPs solution and putted in an orbital shaker for 2 hours. For comparison a sample with just ultrapure water, instead of the coating agent was added. Bare AuNPs and each of the coated ones were compared by using dynamic light sizer (DLS) and UV-Vis, for size measurements; and Fourier transform Infrared spectroscopy was used to evaluate bonds between the nanoparticle surface and the coating agents. Preliminary results showed that AuNPs without any coating agent presented a total smaller size (ca. 51 nm) when compared with the (ca. 84 nm)coated ones. However UV-Vis peaks indicated that the cores of the coated AuNPs are probably smaller than the non-coated. The smaller core size may be due the addition of the coating agent stopping diffusion growth. FTIR was able to confirm the presence of the agents in the NPs surface. Further analysis such as</p>

transmission electronic microscopic should confirm these results.

<< Back