Metallic nanoparticles: Synthesis, characterisation and application

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Abstract: Colloidal sphere-like gold nanoparticles were prepared from an $HAuCl_4$ aqueous solution by the chemical reduction method and by using X-ray irradiation, while rod-like gold nanoparticles were synthesised according to the seed-mediated growth method and by sonoelectrochemistry. Gold nanoparticles exhibit fcc structure. Sphere-like gold nanoparticles have a diameter of 20-60 nm, while rod-like gold nanoparticles have an aspect ratio of 2-4. In UV-vis spectra, the absorption bands related to surface plasmon resonance were observed. Co-Pt nanoparticles of 5-20 nm were prepared by electrochemistry, while Fe-Pt nanoparticles with a size of 5-10 nm were prepared by sonoelectrochemistry. After annealing, these magnetic nanoparticles showed a high coercivity. The gold nanoparticles were functionalised for detecting breast cancer cells.
Author Keywords: Co-Pt nanoparticles; Fe-Pt nanoparticles; Gold nanoparticles; Magnetic properties; Optical properties

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