

Abstract Submitted
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Au/Fe nanoparticles prepared by multilayers annealing¹ AIDA SERRANO, Institute for Ceramic and Glass- CSIC, OSCAR RODRIGUEZ DE LA FUENTE, Dpt. Material Physics - University Complutense at Madrid, MIGUEL ANGEL GARCIA, Institute for Ceramic and Glass- CSIC — Metallic nanoparticles supported onto a substrate can be obtained by thin film deposition and subsequent annealing. The stress relief after the thermal annealing due to the difference of thermal expansion coefficient between the metal and the substrate promotes hillock formation and subsequent hole nucleation, growth and percolation leading to the formation of nanoparticles layers. The nanoparticle size and inter-particle distance can be tuned by controlling the initial film thickness and the annealing time, temperature and atmosphere, providing a simple and low cost method to prepare NPs layers over large areas. The method has been successfully applied to obtain nanoparticles from a single metallic layer in the past. We report here the formation of complex nanoparticles ensembles by deposition and annealing of Au-Fe multilayers. The optical properties of gold nanoparticles (surface plasmon resonance absorption) and the magnetic properties of Fe/Fe oxide ones as well as cross-over effects are studied as a function of multilayers structure and annealing conditions.

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