

Magnetic properties of hybrid composites base on gold and magnetite nanoparticles

O. Moscoso Londoño,¹ D. Muraca,^{1,2} P. Tancredi,³ L. Souza da Costa,²
D. Zanchet,⁴ L. Socolovsky,³ and M. Knobel¹

¹*Institute of Physics Gleb Wataghin,
University of Campinas , Campinas, Sao Pablo, Brazil.*

²*Brazilian Nanotechnology National Laboratory , Campinas, Sao Pablo, Brazil*

³*Engineering Faculty, University of Buenos Aires, Buenos Aire, Argentina.*

⁴*Institute of Chemistry, University of Campinas, Campinas, Sao Pablo, Brazil.*

Hybrid entities composed by gold and iron oxide nanoparticles reveals properties not found in the individual components, that could emerge from new phenomena at interfacial region. In this work we study the structural and magnetic properties of diverse nanoparticles morphologies (core@shell, dumbell-like and flower-like) conformed by gold and iron oxide nanoparticles. According to ours results, by means of XRD, XANES, TEM and *dc* magnetization measures, for the magnetic response of the gold/Fe-oxide, the coupled interfacial area plays an essential role on the magnetization behavior. For example, when the gold and magnetite nanoparticles are in a dimer or flower-like configuration a conventional, and already reported, exchange bias was observed, whereas if the architecture is core@shell, the field cooled hysteresis loop becomes narrower in approximately 60 Oe respect to the conventional ones.