

Abstract Submitted  
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**Fe and Fe oxide nanoparticles ensembles with macroscopic anisotropy**<sup>1</sup> MIGUEL ANGEL GARCIA, Institute for Ceramic and Glass - CSIC — We report here the fabrication Fe and Fe oxide nanoparticles over glass substrates exhibiting macroscopic anisotropy. Fe thin films were deposited onto glassy substrates by thermal evaporation and were subsequently annealed in air and argon atmosphere. The difference of thermal expansion coefficient between the substrate and the metallic film induces stresses in the substrate-metal interface leading to hole nucleation, growing and percolation, and finally to the formation of a metallic nanoparticles layer. Anisotropic nanoparticles can be obtained by applying mechanical stress during the thin the film deposition or the annealing process. The applied stress induce anisotropy axis for the NPs shape that lead to the formation of elongated nanoparticles with macroscopic texture. Anisotropy can be increased by applying a magnetic field during thermal annealing. We analyze here the magnetization and anisotropy of individual nanoparticles and nanoparticles interactions and their relationship with the processing parameters.

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