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Magnetic and Optical anisotropy thiol-capped Au NPs embedded into a polymer JOSE DE LA VENTA, MIGUEL ANGEL GARCIA, VIRGINIA BOUZAS, Materials Physics Dept. University Complutense, ANDREA PUCCI, GIACOMO RUGGERI, Chemistry and Industrial Chemistry Departmen. University of Pisa — The anisotropy at the nanoscale is achieved when the shape of the objects is not spherical such as in the case of nanorods, nanotubes or nanowires. However, when they are embedded in a macroscopic matrix, the random distribution destroys the anisotropy. In this work we study the possibility of induce optical and magnetic anisotropy in a system consisting of spherical thiol capped Au NPs embedded in a polymeric matrix. The ferromagnetic-like behavior arises from the bond between the Au-S atoms and the optical response is also highly dependent on these bonds. So, modifications in the environment and in these bonds could alter the behavior of the whole system. When the NPs are embedded in a polymeric matrix, which is stretched even 40 times in one direction, SQUID and UV/Vis measurements show that arise a macroscopic anisotropy in spite of the spherical shape of the NPs. EXAFS measurements confirm that there are modifications in the Au-S bonds along the stretched direction that are responsible of the induced macroscopic anisotropy.

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