

Novel Hybrid Nanoparticles Based on Squaramides

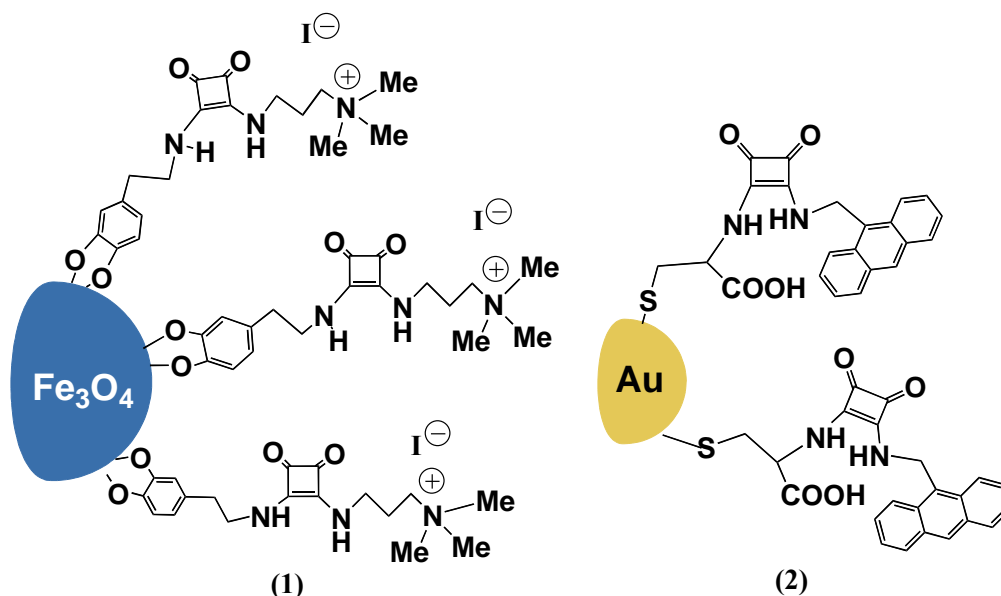
Jeroni Morey, M. Nieves Piña, Juan Robles and Kenia López

Department of Chemistry, University of the Illes Balears, Palma de Mallorca, Spain
jeroni.morey@uib.es

Squaramides have been used in combination with various receptors for molecular recognition of carboxylic acids, carboxylates and several inorganic anions: sulfate, hydrogen phosphate. Nanoparticles provide an adaptable platform for the incorporation of an enormous array of functionalities. In this contribution we describe the preparation of a new hybrid nanomaterials based on the conjunction of iron nanoparticles (1) and gold nanoparticles (2) with squaramide groups. (Figure).

Here we report a simple approach to conjugate monodisperse Fe_3O_4 nanoparticles with various squaramide-ammonium iodide salts, via a readily available linker, dopamine hydrochloride. The iron nanoparticles were synthesized as described by Sun[1]. Dynamic light scattering (DLS) measurements on the dispersed Fe_3O_4 show that the nanoparticles have an average hydrodynamic diameter of 9 nm. Preliminary results seem to indicate the availability of the new hybrid iron nanoparticles for the determination of the following anions: benzoate, tartrate and citrate in water at pH = 8.

The gold nanoparticles (2) were synthesized as described by Hegmann^[2] with few changes. This design reflects the need of cystein as an anchor group in fluorescent squaramide groups to stabilize gold nanoparticles. Transmission electron microscopy (TEM) analysis indicated an average core diameter for (2) of 15 nm. The fluorescence spectrum of the gold nanoparticles (2) showed that the emission of anthracene was dependent on the pH.



References

- [1] J. Xie, C. Xu, Z. Xu, Y. Hou, K. L. Young, S. X. Wang, N. Pourmond and S. Sun, **Chem. Mater.** **2006**, *18*, 5401-5403.
[2] H. Qi and T. Hegmann, **J. Am. Chem. Soc.** **2008**, *130*, 14201-14203.