Gold and silver nanomaterials from organometallic precursors: synthesis and properties

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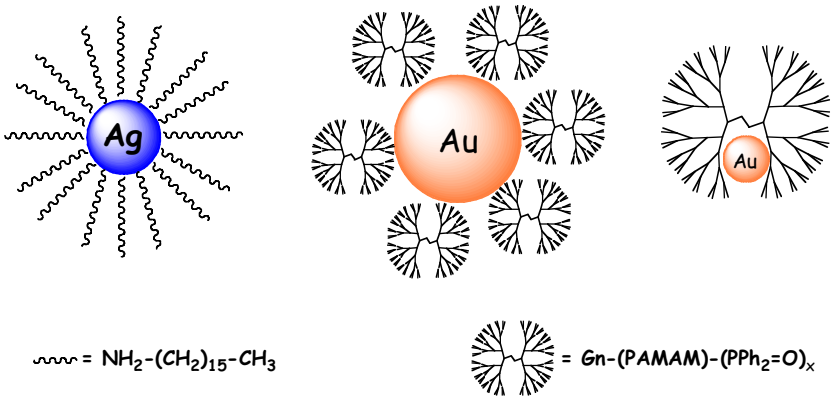
The increased interest in the synthesis of new metal-based nanomaterials stems from the fact that new electronic, optical or magnetic properties can be reached at this length scale. By the use of our experience in gold and silver organometallic and coordination chemistry we have developed new methods for the synthesis of silver and gold precursors and nanoparticles (NPs).

Silver nanoparticles have been synthesized through the decomposition under very mild conditions of the organometallic precursor $[Ag(C_6F_5)]$ in the presence of different types of stabilizing agents. This method leads to Ag NPs of small size (< 10 nm) which are ideal for their use as antibacterial agents.[1]

Gold metallodendrimers have been synthesized by the coordination of $Au^{(I)}$ fragments to the periphery of PPh_2-modified PAMAM or PPI dendrimers. Some of the synthesized metallodendrimers present interesting photophysical properties or can be used as precursors for dendrimer stabilized Au nanoparticles or dendrimer encapsulated Au NPs depending on the experimental conditions.[2,3]



Scheme 1. Ag NPs stabilized by long alkyl chain amines (left); dendrimer stabilized Au NPs (centre) and dendrimer encapsulated gold nanoparticles (right).

References

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