

## Multilayer thin films of anisotropic metal nanoparticles

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The optical properties of metal nanoparticles are extremely sensitive to several parameters, such as particle size and shape, the nature of the environment, and the charge on the surface.

A complete example of such a rich behavior can be found in the layer-by-layer assembly of mixtures of anisotropic and spherical gold nanoparticles. The optical properties of the nanoparticles are greatly influenced by their shape, and upon assembly, strong interactions show up. However, the interactions can be screened by depositing intermediate layers of an inert material.<sup>1</sup>

We also report here on the formation of metal nanoparticles with various shapes and sizes, as a function of several synthetic parameters. The reduction is performed in N,N-dimethyl formamide, with no need of any additional reducing agent, but using poly(vinyl pyrrolidone) as a stabilizer.<sup>2</sup> The amount of polymer has a great influence on the shape of the formed nanoparticles, which in turn determines the shape of the UV-visible spectra. Layer-by-layer assembled films of these nanoprisms display unusual optical properties.

1. N. Malikova, I. Pastoriza-Santos, M. Schierhorn, N.A. Kotov, L.M. Liz-Marzán, *Langmuir*, **18** (2002) 3694-3697.

2. I. Pastoriza-Santos, L.M. Liz-Marzán, *Nano Lett.*, **2** (2002) 903-905.