

Optical manifestation of surface plasmons of bimetallic nanoparticles

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We present a theoretical study about optical properties of Au and Ag bimetallic nanoparticles (NPs) of two different types: core-shell, with the core made of one type of atoms and the shell made of another, and nanoalloys (NAs), which can be chemically ordered or disordered. We have employed the Discrete Dipole Approximation (DDA) method in order to calculate the optical spectra of NPs. DDA has been widely used in studying polyhedral monometallic NPs, besides, it allows to consider size and ambient conditions. We are interested in the optical response of bimetallic NPs of different sizes and morphologies: spheres, cubes and octahedra. Core-shell NPs were studied considering different shapes of core and shell, as well as distinct shell thicknesses. We analyze the spectra of absorption and extinction coefficients, and the originated effects in the position, intensity and number of Surface Plasmons (SP) of the bimetallic NPs due to the coupling of metal-metal SPs.

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