

Abstract Submitted
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Electron Energy Loss Spectroscopy study of surface plasmon resonances in noble metal nanostructures. SHAUL ALONI, Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA 94720 — Noble metal nanostructures are of great interest because of their unique optical properties. Their optical properties are determined by the surface plasmon resonance of conduction electrons, the frequency of which is determined not only by the nature of the metal or alloy of which the particle is made but also by the particle's size and shape. Moreover, the properties can be further tailored by forming nanoparticle assemblies and by controlling the surrounding dielectric medium. We focus on study of the shape effects of the plasmonic excitation in silver and gold nanostructures. The silver and gold nanostructures were synthesized by solution phase synthesis yielding highly faceted nanocrystals including cubes, triangular plates, bi-pyramids, and rods of aspect ratios up to 1:20. The results show that the optical properties of individual metallic nanoparticles, as extracted from the low-loss spectrum, can be correlated with the properties predicted based on the particle size, shape, and composition. .

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