Identification of Low-Level Sulfur Contaminants by Amplitude and Phase-Sensitive Detection of Single Particle Surface Plasmon Scattering

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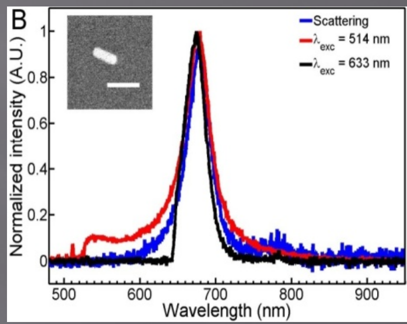
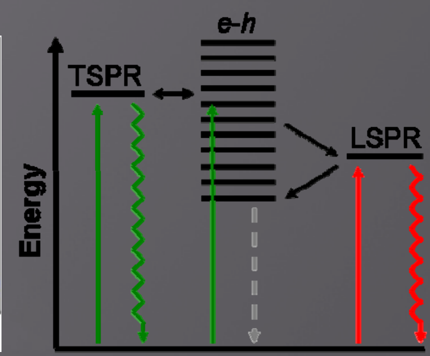
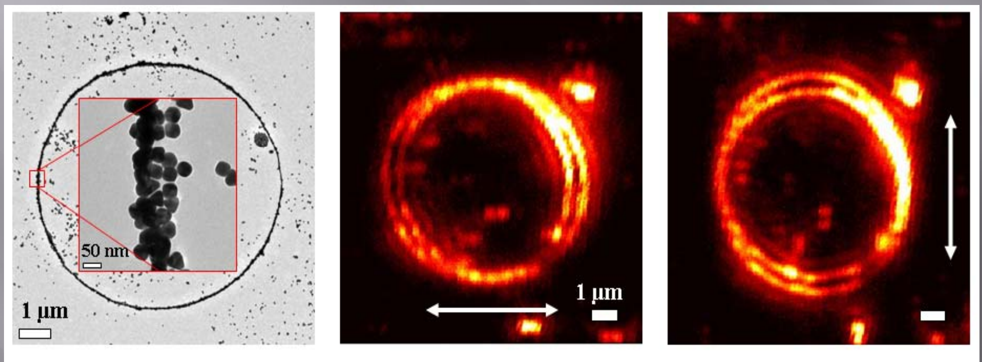
One-photon luminescence of gold nanoparticles: Correlated electron microscopy and single particle spectroscopy is necessary to understand photophysical processes in metal nanoparticles. We found that the luminescence of gold nanorods follows the plasmon resonance scattering independent of the excitation wavelength. These results have led to a more detailed understanding of the one-photon luminescence of plasmonic nanoparticles.







Coupling between substrate images and collective nanoparticle plasmons: Single particle spectroscopy requires the presence of a substrate, which however can influence the surface plasmon resonance. In addition to a dielectric effect, conductive substrates can efficiently couple to nanoparticle plasmons through the interaction with induced image charges.

Intensity modulation of nanorod plasmons: The surface plasmon resonance depends on the surrounding medium of the nanoparticles. We have covered single gold nanorods with a nematic liquid crystal. By switching the orientation of the liquid crystal molecules with an applied electric field we were able to actively modulate the polarized scattering intensity of single gold nanorods.