SYNTHESIS OF DESIGNER METAL NANOPARTICLES FOR SENSORIC APPLICATIONS

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The plasmonic properties of nanoscale metal structures depend on parameters such as material composition, dimensions, shape and optical properties of the surrounding media. Therefore designer particles with a chosen absorption band are possible by e.g. choice of the material composition in the case of core-shell particles. We present here work towards the design and synthesis of core-shell particles using Au/Ag and Ag/Au systems and nonspherical particles. The optical properties were determined both on an ensemble level using UV-VIS spectroscopy [1] as well as in a single particle approach in order to determine the scattering spectra of individual particles. This single particle approach can be combined with AFM imaging of the same particle even inbetween several steps of e.g. shell growth. The change of the surrounding media (e.g. attachment of bioanalytes to particles) induces shifts in the absorption band position that can be used in sensoric applications.

[1] A. Steinbrück, A. Csaki, G. Festag and W. Fritzsche, Plasmonics 1 (2006) 79.