

CBIMMS Invited Seminar

“Morphological Synthesis of Gold and Silver”

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ABSTRACT

The syntheses of gold and silver nanoparticles with well-defined size, shape, crystal structure and surface properties have been investigated. Manipulation of the geometric parameters of these nanoparticles results in a precise control of their surface plasmon resonance optical properties, which is critical considering their applications as biosensor materials. In particular, monolayer-protected gold nanoparticles of size within 1-5 nm will be discussed at first, surface functionalization with carboxylate groups render these particles water-soluble, making them a good candidate for biological labeling applications. Secondly, the synthesis of silver nanoplates using a simple chemical reduction method will be presented. Nanoplates with average thickness of 20 – 30 nm and average size tunable from 40 to 300 nm are formed, which makes the in-plane dipole plasmon absorption bands shift to ~1000 nm, opening new possibilities for various near infrared related applications. Then, formation of multipod gold nanocrystals including tadpole-like or teardrop-like monopods, L-shaped, I-shaped, and V-shaped bipods, T-shaped, Y-shaped, and regular triangular tripods or cross-like tetrapods, will be given. At last, the possible applications of the shaped particles in biosensor areas will be briefly discussed.