

## Size-controlled synthesis of octahedral gold nanoparticles and their application to SERS

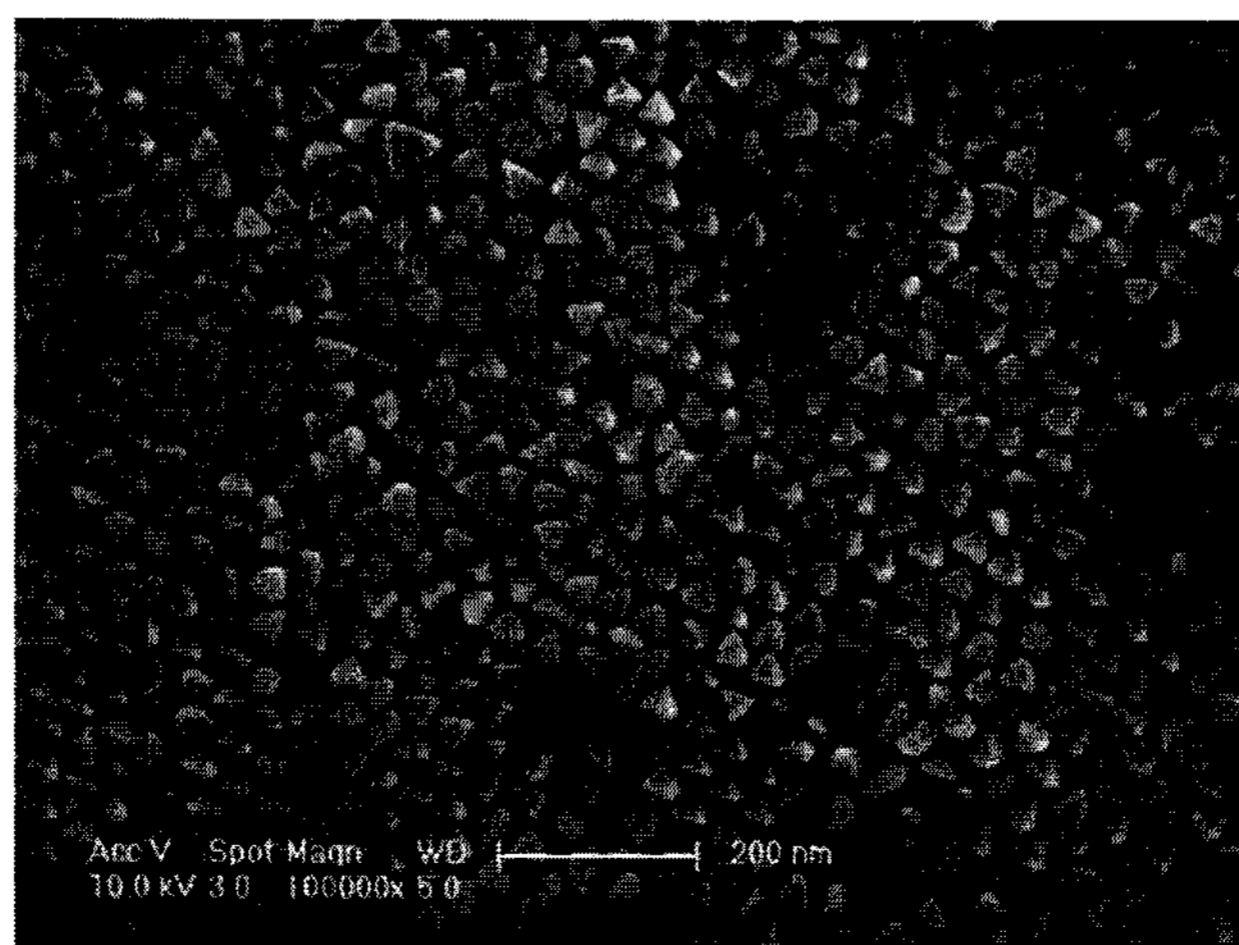
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We report on the high-purity synthesis of octahedral gold nanoparticles with controlled edge-length of about 30 to 70 nm. The nanoparticles were synthesized in an aqueous solution of HAuCl<sub>4</sub> and cetyltrimethylammonium bromide (CTAB) in the presence of ascorbic acid and NaOH. Field emission scanning electron microscopy (FE-SEM) and high resolution transmission electron microscopy (HR-TEM) were used in the characterization of the gold nano-octahedron. The octahedron was found to consist of mostly {111} facets as revealed by HR-TEM. SERS enhancement efficiency of the gold nano-octahedron was also examined, which was compared to that of differently-shaped gold nanoparticles. Furthermore, the underlying SERS enhancement mechanism was discussed with local plasmonic observations.



FE-SEM image of octahedral gold nanoparticles