

Synthesis of Micrometer-Sized Gold Nanoplate for Jewelry Application

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ABSTRACT

Micrometer-sized gold nanoparticles exhibit novel optical properties and attract considerable interests in a range of applications. This article presented the chemical synthesis of micrometer-sized gold nanoplates in order to apply this product of gold nanotechnology synthesis for further jewelry applications. This article focused on the effect of concentration of gold solution (Gold (III) Chloride Hydrate, HAuCl_4) that related to growth controlling of micrometer-sized gold nanoplates. Polyvinylpyrrolidone (PVP) and Ethylene glycol, (EG) were employed as stabilizer and reducing agent, respectively. The morphology of synthesized micro-sized gold nanoplates was determined by Scanning Electron Microscope (SEM). The SEM images showed various shapes of synthesized micrometer-sized gold particles including circular, triangular, truncated triangular and hexagonal shapes. The UV-Vis NIR spectrum revealed the formation of gold nanoplates. The experimental results indicate that the prediction of sizes and shapes of micrometer-sized gold nanoplates can be performed by controlling the concentration ratio of gold precursor.

Keywords: gold, gold microplate, micrometer-size gold nanoplate, gold synthesis, jewelry