2Dlayer stacked metallic Cu-Serine triangular pyramids and their Surface Plasmon Resonance properties

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Abstract

2D copper crystals are synthesized by following a novel solution process. Layer stacked 2D metallic Cu nanostructures are successfully synthesized by chemical reduction using L-Serine and ascorbic acid. SEM and TEM images showed the formation of 2D crystals of copper which are layer by layer stacked to deliver triangular pyramidal structures with embedded spherical as well as rod shaped Cu NPs. Surface Plasmon Resonance (SPR) is studied as a function of pH and concentration of L-serine. SPR is originated from the sharp corners and edges of the triangular pyramid structure and large number of surface particles of copper which are embedded on the 2D copper sheets. The results are highly useful for the development of non-noble metal based SPR sensors.

Keywords

Cu nanoparticles, 2D layers, Surface Plasmon Resonance, triangular pyramid, L-serine**.**

1.Introduction

Surface plasmon resonance (SPR) of metallic nanostructures, a very common phenomenon in metallic nanostructures, is originated by the interaction of electromagnetic radiation with the conduction electrons at the surface of the metal nanoparticles. This phenomenon has been studied extensively aiming at different applications like catalysis, biomedical sensors, electronics and is also exploited for non-linear optical