SYNTHESIS OF GOLD NANOPARTICLES IN NONAQUEOUS MEDIA

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Nanoscience and nanotechnology were developed jointly given the need to develop small-scale devices and understand the properties of matter at this level. Currently there are numerous methods of synthesis that allow to obtain nanoparticles (NPs) of various materials, controlling the composition and size; however, control his shape is still a challenge. The use of a new type of ionic liquid (IL), known as deep eutectic solvent, offers a green route for obtaining gold nanostructures star-shaped. This specific morphology presents a large surface area and a high reactivity, which is useful for various applications, such as biomedicine, development of biosensors, catalysis and bioimaging.

In the synthesis process, gold(III) chloride trihydrate (HAuCl₄·3H₂O) and L-ascorbic acid (C₆H₈O₆) were used as precursor of Au and reducer, respectively. This synthesis is based on the redox reaction between HAuCl₄·3H₂O and the L-ascorbic acid, with a stoichiometric ratio of 1:7.79 at 90 °C for 1 hour.

The ionic liquids components were urea, thiourea and choline chloride. The ionic liquid with which we worked was composed with a molar ratio of 2:1 of urea/choline chloride and it was analyzed under the same synthesis conditions, varying only the amount of thiourea.

The nPs solution was subjected to UV-Vis analysis in order to identify the plasmon of resonance. Subsequently the NPs were purified and centrifuged. The remaining solid was dried and characterized by the technique of Transmission Electron Microscopy (TEM).

Keywords: Ionic-liquid, star-shaped, nonaqueous-media

References:


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