GREEN SYNTHESIS OF COOPER NANOPARTICLES AND GENERATION OF A CONDUCTIVE BIO-COMPOSITE

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Metallic nanoparticles have been a very interesting field of study in the last years, always looking for new properties. Copper nanoparticles have been studied before due to their optical, thermal and electrical properties. The synthesis of this material is usually performed by reductant agents that sometimes are expensive and toxic for human health, as NaBH₄. In this work, a new green synthesis method for copper nanoparticles was developed. The synthesis was carried out by a microwave assisted method, using sodium alginate as reductant and stabilizer molecule. Sodium alginate films were prepared and they were doped with the synthetized copper nanoparticles in order to generate a conductive nano-biocomposite. The structural characterization was carried out by UV-Vis, XRD, DLS and SEM, and the conductivity of the material was measured. The absorptions spectra shows a plasmonic resonance signal at 570 nm, which correspond to the copper nanoparticles. XRD analysis confirmed the metallic Cu phase with non-presence of oxides or copper salts. Particle size distributions were obtained for the Cu nanoparticles when studied by Dynamic Light Scattering, where the metal concentration and microwave heating time were studied. SEM images shows that the Cu nanoparticles have a spherical morphology and the presence of agglomerates depends on the alginate concentration during the synthesis method.

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References:


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