

Green Synthesis of Copper Nanoparticles and their Antibacterial Property

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Abstract

We report the synthesis of copper nanoparticle using a completely green protocol. Aqueous copper sulphate solution was used as a precursor of copper nanoparticle whereas L-ascorbic acid and starch acted as reducing agent and stabilizer respectively. Formation of copper nanoparticle was confirmed by colour, UV-VIS spectroscopy and X-Ray Diffraction (XRD) results. The as-synthesized copper nanoparticles show characteristic plasmonic band at 590 nm. High-Resolution Electron Microscopy (HRTEM) shows almost spherical particles having average diameters of 5.7 ± 1.8 nm. As-synthesized copper nanoparticle exhibits antibacterial activity for both Gm-positive bacteria, *Bacillus subtilis* and Gm-negative bacteria, *Escherichia coli*. Plate count and Minimum Inhibitory Concentration (MIC) studies show higher susceptibility of *B. subtilis* towards copper nanoparticle.

Keywords: Antibacterial Activity, Copper Nanoparticle, Green Synthesis