

Biological Synthesis of Copper Nanoparticles Using Plant Extract

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We report biological copper nanoparticle synthesis using plant leaf extract as reducing agent. On treatment of aqueous solutions of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ with leaf extract (Magnolia), stable copper nanoparticles formed. UV-vis spectroscopy was used to monitor the quantitative formation of copper nanoparticles. The synthesized nanoparticles were characterized with ICP, EDS, TEM and SEM. TEM and SEM analysis of copper nanoparticles indicated that they ranged in size from 40 to 100 nm. Antibacterial tests were carried out by counting viable *Escherichia coli* cells after 24 h growth in shake flasks containing latex foams coated with copper nanoparticles. As a result, foam coated with biologically synthesized copper nanoparticles showed higher antibacterial activity compared with foams untreated. As possible ecofriendly alternatives to chemical and physical methods, biologically synthesized nanoparticles using plant extracts may have applications in various human body-contacting areas.