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Review Article

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SYNTHESIS AND CHARACTERIZATION OF CU NANOPARTICLES OF LEUCAS CHINENSIS L. PLANT

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ABSTRACTS

Nanotechnology is a rapidly growing technique, due to its wide application in various fields viz. Medical, Engineering, Chemistry, Biotechnology and Physics etc. The Synthesis of Copper nano particles by green chemistry method effective tool to overcome nanoparticle yield. Copper nanoparticles are of great interest due to its low cost and easy availability with like other metal nano particles. This method copper source used as copper sulphate. Size comparision of particles synthesized done by SEM, FTIR and XRD techniques. The Leucas Chinensis L. Plant leaves have antipyretic, antioxidant, antibacterial, hepatoprotective, antidiarrhoeal, and antifungal activity. Production cost is very low as compare to nobel metals. The process is non toxic and environmental friendly green method. Difficult to preserved nanomaterial as they oxidized immediately when exposed to air. The X-ray Diffraction analysis show the average particle size is about **60.23 nm**

KEYWORDS: Cu nano, SEM, XRD, hepatoprotective activity.

INTRODUCTION

Since early days, man has been using materials available around him to improve his lifestyle. Man learned to find and prepare materials with very novel properties, properties totally different from that of the bulk material. The race is now to achieve perfection in materials by Nanotechnology. Nanotechnology is the term used to cover the design, construction and utilization of functional structure with at least one characteristic dimension measured in nanometers. The most important criterion for a material to be called as a nano is that its properties must vary with the decrease in size (from bulk to nano). It has been said that a nanometer is "a magical point on the length scale, for this is the point where the smallest man made device meet the atoms & molecules of the natural world."

The research community is actively pursuing hundreds of applications in nanomaterial, nanoelectronics, and bio-nanotechnology. Most near term (1-5 years) applications of nanotechnology are in the form of nanomaterial. These include materials such as lighter and stronger nanocomposites, antibacterial nanoparticles, and nanostructure catalysts. Nano devices and nano electronics are farther off, perhaps 5-15 years, and will have applications in medical treatments and diagnostics, faster computers, and in sensors. This technology will have tremendous potential if it can developed; simple applications involves the creation of new and powerful materials, perfect diamond in bulk quantities and a tool to manipulate objects on any scale.

MATERIAL AND METHOD

For synthesis of copper nanoparticles Lucas Chinensis L. Plant leaves collected from the chandanapuri region of Sangamner tahsil of Maharashtra district (India) and the taxonomic identification was made by Botanical Survey of India, Pune. The plant leaves dried for 2 days in sunlight. The dried leaves grind to make fine powder. Weigh 40 g leaves powder and 250ml sterilized distilled water to boil the mixture for 10 mins before decanting the mixture. The prepared plant leaf broth stored at 4^{o}c. Volumetrically 15ml of leaf broth was added to 85 ml of 1 mmol L^{-1} copper sulphate solution for reduction of copper ions. The mixture was stirred on magnetic stirrer for 12 hrs. The resulting solution was centrifugation at 20,000 rpm for period of 15 min. The finely powdered nanoparticle was characterized by XRD and FESEM techniques.

Fig: Plant leaf and flower photo

RESULTS AND DISCUSSION

X- ray Diffraction (XRD) analysis- The particle size and nature of the copper nanoparticle were determined using XRD. X-ray powder diffraction is a rapid analytical technique primarily used for phase identification of a crystalline material and can provide information on unit cell dimensions. The analyzed material is finely ground, and average bulk composition is determined. The particle or grain size of the particles on the copper nanoparticles was determined using Debye Sherrer's equation = 0.94λ / B $\cos\theta$. The nanosize obtained was **60.23 nm**.

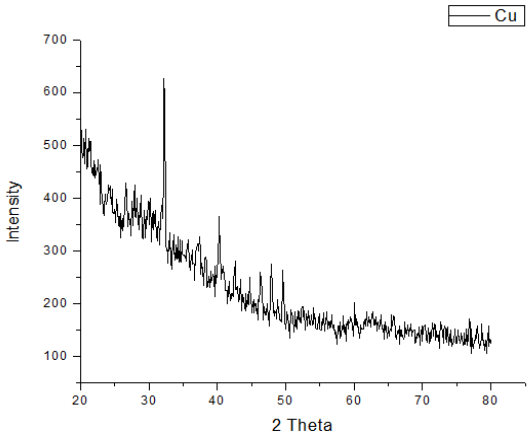

Fig: 1 EDX spectra recorded from a film, after formation of copper nanoparticles with different X-ray emission peaks labeled

Spectrometer (FESEM) analysis

Field emission scanning electron microscope is a type of electron microscope that images a sample by scanning it with a high-energy beam of electrons in a raster scan patterns. In this experiment after the synthesis of nanoparticles using the plants and then lyophilisation was done using Virtis Benchtop machine. The morphology of nanoparticles done by FESEM analysis. The nanoparticle shapes was observed square, rectangular and pentagonal with **60.23 nm.**

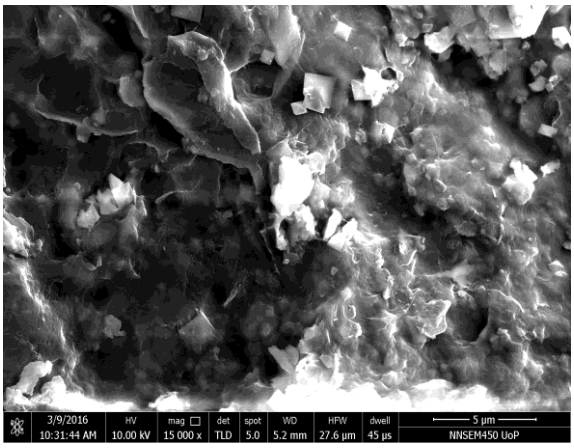

Fig: FESEM image of Cu nanoparticles

The plant originated nanoparticles of shape square and pentagonal shows particle size **60.23 nm.** The methodologies uses for this synthesis of nano particle from Leucas Chinensis L. is in dibasic media.The Ethyl acetate extract of Leucas Chinensis L. shows potent antibacterial and antifungal activity.

Conclusion The aqueous extract of Leucas Chinensis L. plant is capable for the synthesis of copper nano particles by green method. The synthesized nanoparticles were characterized by FESEM, EDX which shows particle size 60.23 nm. The nano particles may exhibit significant antimicrobial activity. Plant extract is capable for the synthesis.

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REFERENCES

1. Umesh Kathad* And Dr. H P Gajera, Synthesis Of Copper Nanoparticles By Two Different Methods And Size Comparision, Int J. Pharm Bio Sci, July, 2014; 5(3): 533–540.
2. Sivkumar J, Premkumar C, Sonthanam P, Saraswati N, Preparation of Silver Nanoparticles using Calotropis giganteam Leaf, African Journal of Basic and Applied Science, 2011; 3(6): 265-270
3. Synthesis of Pomegranate peel extract mediated Silver nanoparticles and its antibacterial activity, American Journal of Advanced Drug Delivery, 2014; 2: 174 -182
4. Green synthesis of silver nanoparticles by using Polyalthia logifolia leaf extract along with D-sorbitol and study of its antibacterial activity, Journal of Nanotechnology, 2011.
5. D. V. Parikh, T. Fink, K. Rajasekharametal "Antimicrobial silver sodium carboxymethyl cotton dressings for burn wounds", Textile Research Journal, 2005; 75(2): 134-138.
6. M. Sastry., K. S. Mayyaa., K. Bandyopadhyay, pH dependent changes in the optical properties of carboxylic acid derivatized silver colloid particles. Colloids Surf. A., 1997; 127: 221-228.
7. K.T. Bharati, D.B. Gujarathi, N.D. Phatangare, S.K. Ghotekar, S.K. Wakchure, S.N. pande, Green synthesis of silver nanoparticles by Caralluma Fimbriata & its characterization. Indian journal of Applied Research, 2015; 5(2): 748-749.