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SYNTHESIS OF MGO NANOPARTICLE BY NEEM LEAVES OBTAINED FROM LOCAL AREA OF KOTNI VILLAGE, CHHATTISGARH THROUGH GREEN METHOD

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ABSTRACT
Metal oxide nanoparticles can be used in electronics, catalysis, ceramics, petrochemical products, coatings and many other fields such as sound-proof, light-weight, heat-insulating and refractory fibre board and metallic ceramics. Synthesis of metal oxide nanoparticles can be done through three methods like physical, chemical, and green methods. Present work focus on synthesis of MgO nanoparticles by Neem leaves through Green method. This method is non-toxic and eco-friendly. In this work, the precursor materials was $Mg(NO_3)_2$ and fresh Neem leaves extract. The Neem leaves extract acting as a reducing agent in the reaction.

KEYWORDS: Magnesium Oxide; Green Synthesis; Neem leaves; Seed germination.

INTRODUCTION

Green synthesis techniques make use of moderately pollutant free chemicals to synthesis Nanoparticles and embrace the use of benign solvents such as water, natural extracts. Green chemistry seeks to reduce pollution at source. It is enhanced to prevent waste than to treat or clean up waste after it is formed. Though physical and chemical methods are trendier for nanoparticles synthesis, the biogenic fabrication is a better choice due to ecofriendliness Nanoparticles due to their smaller size and large surface to volume ratio exhibit remarkable novel properties and methodical applications in the field of biotechnology, sensors, medical, catalysis, optical devices, DNA labelling, drug delivery and they are rewardingly treated as a bridge between bulk material and atomic and molecular structures MgO nanoparticles have found fabulous application in bimolecular detection, diagnostics, and microelectronics. Green synthesis of MgO nanoparticles were agreed out using Neem leaf extract for the ecofriendly development of novel technologies. Recently, nanoparticles (NPs) have attracted a lot of attention because of their use in a variety of areas such as electronic, cosmetic, biomedical, energy, environmental, catalytic and material applications. The large increase in the of use of NPs has stimulated researchers to know the application of NPs in plant growth. Limited studies have been reported on both the positive and negative effects of NPs on plants Researchers have reported both positive and negative evidences for the mechanism. Moreover, the toxicity of NPs depends on their properties, test organism species and surrounding conditions. Bulk Magnesium this article, it is show Oxide (MgO) is very insoluble in soil; however, plant roots have the ability to solubilise MgO in the vicinity. In the increased surface-to-volume ratio of nano-MgO, which was prepared by Green Method in our laboratory and characterized, was found very suitable for seed germination. This could be observed visually in Solanumlycopersicum and Cicer arietinum seed germination.

EXPERIMENTAL METHODS

MATERIALS AND METHODOLOGY

Present investigation is focused on the synthesis of the MgONPs. The green synthesis method is used to synthesis the MgONPs using the precursor materials such as Magnesium nitrate and Neem (*Azadirachta indica)* leafextract has been used as reducing agent to synthesis the corresponding NPs.

Study Area

The study area covered in this research was local area of Kotni village of New Raipur district in the state of Chhattisgarh, India. Kotni is a village in Arang Tehsil in Raipur District of Chhattisgarh state, India. It is located 25 km towards East from districts quarters Raipur.17KM from Arang.26KM from state capital Raipur. Total population of Kotni village is 1561 and number of houses are 290

Preparation of Neem Leaf Extract

To prepare the Neem leaves extract; 5 g of Neem leaves were washed thoroughly with distilled water anddried for 15-20 minutes at room temperature. The extract solution was prepared by boiling dried leaves in 500ml beaker consist 200 ml of distilled water for one hour at 100^0C.

Freshly prepared Neem leaf extract was used for the synthesis of MgONPs. Freshly prepared extracts alone have been used throughout the study.

Synthesis of MgO Nanoparticles

In the experiment, 5 ml of fresh leaves extract and 20ml of distilled water was added to a 250ml beaker and heated at 60oC. 5 gram of Magnesium Nitrate is added to the solution and heated at 80oC with continuous stirring for 4hours. The Magnesium nitrate ions were reduced to Magnesia or Magnesium Oxide nanoparticles by using Neem leaves extract. The formation of Magnesium oxide nanoparticles (MgONPs) have been observed by color change of the solution from yellow to yellowish-brown color.

RESULT AND DISCUSSION

Magnesium Oxide was synthesized by Green synthesis method from Magnesium Nitrate Mg $(NO_3)_2$, NaOH.

Using Neem (*Azadirachta indica)* Leaf Extract. The influence of various parameters viz. Stirring temperature, Concentration of Neem leaf extract, calcinations temperature were also checked and conditions were optimized for the synthesis of MgONPs.

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