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GREEN SYNTHESIS OF ZINC NITRATE NANOPARTICE USING PETAL EXTRACT

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ABSTRACT:

Zinc nitrate is an inorganic chemical compound with the formula Zn(No3)2. This white, crystalline salt is highly deliquescent..Sodium Hydroxide is a highly caustic base and alkalithat decomposes proteins at ordinary ambient temperatures. Rosaceae, the rosa family is a medium sized family of floweringplants that includes 4828 species in 91 genera.Zinc nitrate nanoparticles are synthezide by Rosa Indica petal extract at reducing agent with zinc nitrate and sodium hydroxide. catalyst in the manufacture of other chemicals,in medicine,and in dyes and various others chemicals. Toxic oxides of nitrogen libereated, when heated. It is soluble in both water and alcohol. It is used as synthesis of coordination polymers.Zinc nitrate is related compounds to copper nitrate.The morphology was characterized by Ultra violet spectroscopy(UV), Fourier Transformer Infrared Spectroscopy (FTIR),Scanning Electron Microscopy (SEM),Antibacterial was evaluated in characterized by Zinc nitrate nanoparticles.The obtained results show that the green treated Z(no3)2 nanoparticles can act as a better photocatalytic material.

KEY WORDS:

Nanoparticles, Zinc Nitrate, Rosa Indica Extract, UV, SEM, FTIR, Anti-bacterial.

1.INTRODUCTION:

Nanomaterials are materials with nanoscale dimensions where the surface or interface properties dominate over the bulk properties.They very large surface area of these Nanomaterials can result in novel physical and chemical properties,such as increased catalytic activity,improved solubility,or different options. Nanomaterials- in the form of synthetic nanoparticles- are already found in a wide variety of consumer products ,such as textiles,paints,sunscreens,and other healthcare products.Intensive research is being done in the use of Nanomaterials for energy storage and energy conversion,pharmaceuticals,life science applications,solar cells,catalysis,and composite materials to name just a few. $Zn(NO_3)_2$ is an inorganic chemical compound with a chemical name Zinc nitrate. It is also called Zinc dinitrate or Celloxan or Zinc Nitrate Hexahydrate.It is widely used as a catalyst to manufacture in medicine, dyes, and various other chemicals. Celloxan is a white to colourless, crystalline solid which is highly deliquescent. It is soluble in alcohol as well as water. It is a non-combustible compound but has the power to accelerate burning of other combustible compounds. Toxic oxides of nitrogen are liberated when heated.Sodium hydroxide also known as lye and caustic soda, is an inorganic compound with the formula NaOH. It is highly soluble

in water, and readily absorbs moisture and carbon dioxide from the air. It forms a series of hydrate.Many Nanomaterials exit in the form of nanoparticles in dispersions. But other materials can also make use of nanostructures within them. For example, Metal Organic Frame works (MOFs) incorporate nano-voids in their crystal structures and can be host carriers for large concentrations of other molecules. This includes active pharmaceutical ingredients (APIs).When MOFs are dispersed as nanoparticles in biocompatible fluids, surface modification enables them to access cells and then release a wide range of active and targeted pharmaceutical drugs directly Where they are required in the body.

2. EXPERIMENTAL

2.1 MATERIALS:

Zinc nitrate was purchased from the laboratory bishop. Rosa Indica petals were collected from the local market. All chemicals and vegetables are of analytic grade and used without further purification

2.2 PREPARATION OF PETAL EXTRACT:

At first Rosa Indica collected from the campus, were throughly washed with double distilled water to remove any dirt adhered to the surface. Now, petals were allowed to dry in a tray drier. The 10g Petals was added in to 100ml distilled water and then boiled for 25 minutes at 90C.The extract was allowed to cool at room temperature and then filtered by using filter paper.

2.3PREPARATION OF SODIUM HYDROXIDE (NaOH):

0.02g of Salt was added in to 20ml distilled water and then boiled for 25 minutes at 90C.Untill,it obtain light yellow color.

2.4SYNTHESIS OF ZINC NITRATE SOLUTION:

Zinc nitrate solution has been prepared by precipitation method to 0.1 mol of zinc nitrate is dissolved in 100ml of distilled water by using stirrer at room and by stirring it for 50 minutes.Finally zinc notate solution was kept at room temperature for about 24 hours and the filtered by using filter paper.

2.5SYNTHESIS OF ZINC NITRATE NANOPARTICLE:

50ml of petal extract was added with 100ml of zinc nitrate solution and then it was stirred for 2 hours using the magnetic stirrer machine.NaOH solution was added drop by drop and then it was stirred for 1 hours using the magnetic stirrer machine. The prepared solution was kept without any disturbance over a night. Then was the solution several times, using distilled water to remove the impurities. Then, the formed zinc nitrate nanoparticles mixer was dried in a hot air oven at 80C. After,complete drying zn nanoparticles obtained were scraped and stored in a beaker for further characterization.

3.RESULT AND DISCUSSION

3.1 FTIR ANALYSIS:

The FTIR spectroscopy is used to study the change in chemical composition impurity content and interaction between different species. FTIR spectrum is used to calculate various functional groups. Which are present in Z(nO3)2 nanoparticles and alsoused to determine the absorption range.The FTIR spectrum of the Z(nO3)2 nanoparticle which were synthesized by precipitation method. The wave number at 3426 represents the stretching vibration of O-H(strong). The wave number at 2049 represents the stretching vibration of N=N=N(strong).The wave number at 1627 represents the stretchimg vibration of C=C(stretching).The wave number at 1103 represents the stretching vibration of C-O(stretching).The wave number at 590 represents the stretching vibration of C-Br(stretching).

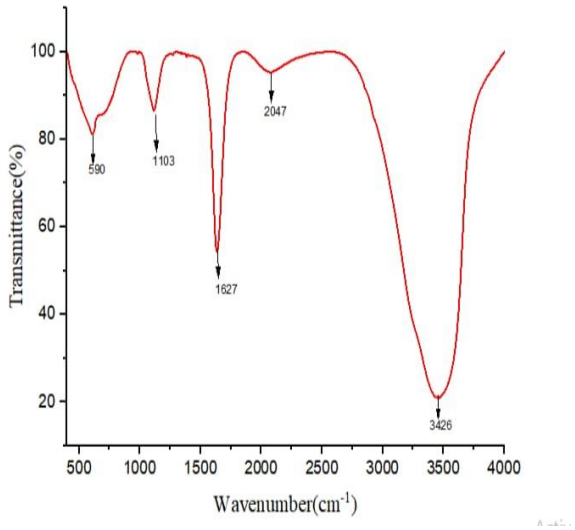

Figure 1 FTIR Analysis of synthesized Zinc nitrte nanoparticles using R.Indicapetal Extract

3.2UV- ANALYSIS:

The absorbtion spectra were used to study the energy band and type of electron transitions.The absorption peaks obtained for these samples in the range of. Which is prescribed for zinc nitrate.For the peak the corresponding absorbance range is. For the peak the corresponding the absorption range is .The absorption band energy can be calculated from Einstein's photon energy equatio

$$E=hc\backslash\lambda max$$

λmax-Maximum absorbance wavelength

h-plank's constant($6.6x10^{-34}$js)

c-Speed of light (3x10 m\s^2)

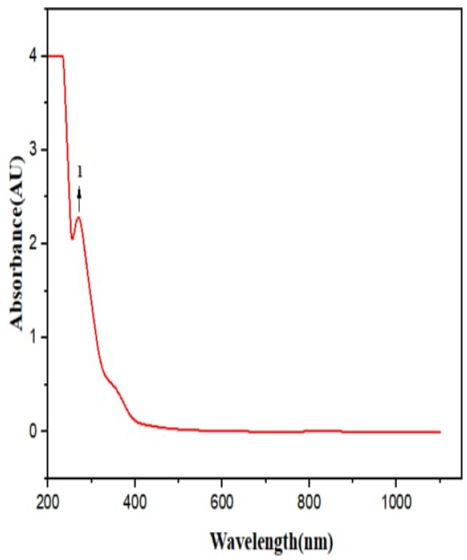

Figure2UV-Analysis of zinc nanoparticles using R.Indica prtal extract

4.CONCLUSION:

Medicinal plants have medicinally important compoundsto theirdifferents parts.The synthesis of nanoparticles using plants depends on the nature of plants depends on the nature of plants such as its phytochemical content, special adaptation.and medicinal importance. In this study we investigated eco friendly and cost effective green synthesis of Z(no3)2 nanoparticles using petal extract. The project deals with the synthesisof Z(no3)2 nanoparticles by precipitation method.The characterization of nanoparticles was done by scanning electron microscope (SEM),UV-visible spectroscopy,Fourier transform infrared (FTIR),Antimicrobial activity. The synthesized zinc nitrate nanoparticles explain that the nitrate nanoparticle.The UV visible spectroscopy showed a peak range of 268.55nm and the band gap energy of zinc nitrate have been found. FTIR analysis showed the absorbtion peaks at 590cm^{-1} respectively indicating the O-H group in zinc nitrate nanoparticles.The synthesis zinc nitrate nanoparticles exhibited an excellent antibacterial activity.

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