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Synthesis and Characterization of Nickel-Bismuth Aluminium Ferrite Nanoparticles by Sol-Gel Technique

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Abstract

Bismuth doped Nickel Aluminium ferrite $\text{Ni}_{1-x}\text{Bi}_x\text{Al}_y\text{Fe}_{2-(x+y)}\text{O}_4$ (where $x=0, 0.025, 0.050, 0.075, 0.1, 0.15$) and ($y=0, 0.1, 0.2, 0.3, 0.4, 0.5$) Nanoparticles were synthesized at low temperatures using a simple, cost-effective sol-gel auto oxidation. The standard softness of nickel aluminium ferrite is a big amount of use. Nickel Bismuth Aluminium ferrite is soft ferrite. The existing job is to survey the knowledge and magnetic place of Bi doped Nickel Aluminium nano-ferrite the synthesized samples. To obtain the parameters of hysteresis, the VSM was used. With changes in the Bi percentage, the magnetic property of the ready samples shows important effect. Spine) ferrite is confirmed from FTTR.

Keywords: Sol-gel; Ni-Bi-Al nanoferrite; XRD; VSM; FTTR etc.

1. Introduction

In the shape of collisions, powders, clusters, rods, wires, and thin films, a wide range of techniques are required to synthesize various forms of nanomaterial [1]. Nanomaterial preparation divided into two wide top-down and bottom-up spectrums, each of which has two physical and wet chemical paths. The nearly big parameters for the activity of nanoparticles are the correct size, well-scattered particles with a small size distribution, equiaxial particle structure, full status, and uniform mixture. Many wet-chemical approaches have the typical characteristic of atomic or molecular scale mixing of materials. Any of the non-conventional methods are a acting of sol-gel, the procedure of co-precipitation, acting of precursor, acting of combustion, hydrothermal, drying by spray. From Etc [2].

1.1 Sol-gel auto combustion Process

All the samples were processed using the auto combustion methodology of Sol-gel in the current work. For the combustion phase, oxidizing metal salts and combustion fuel are important in the Sol-gel auto combustion method. As oxidizing salts and combustion fuel for all of the sample preparations, metal nitrates and citric acid were in use. Both chemicals had an analytical reagent of high purity and were used without further purification. For the analysis of ultrafine hexaferrite powders, the Sol-gel auto oxidation process has been shown to be a super simple, time-saving and energy-efficient path [3].

1.2 Principle

The gelling and eventual burning of an liquid solution containing salts and organic fuel is the basis of the Sol-gel process. As starting ingredients, oxidizing metal salts such as metal nitrates and a burning fuel such as citrate acid, polyacrylic acid, or urea are used. Citric acid is ideal for receiving precursors of change metal oxides due to the strong potential of chelating metallic ions and too low temperatures of decomposition. During the initial stage of the preparation process, this approach uses a solvent, since the reactants are well-dispersed to have a homogeneous reaction mixture in a much higher reactive state. Organic fuel plays an of import role in the combustion reaction; it forms complexes with metal ions that prevent hydroxylated compounds from precipitating. It is possible to understand combustion as a

EFFECT OF LIGHT INTENSITY & DISTANCE OF THE LIGHT SOURCE ON THE OUTPUT VOLTAGE OF SOLAR CELL

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Abstract: Now days there are different types of advance photovoltaic materials are available for different applications. The output of the solar cell depends on the strength of the light source and materials used for Solar Panel. We compared the effect of distance and intensity of the different light sources on the output of solar cell. In this paper we are use natural source i.e. sun as well as artificial sources like LED bulb of 9 Watt and Tungsten Filament lamp of 200Watt. It is observed that the output of the solar panel is increased with the strength of light source keeping same material of Solar Panel. At specific intensity the output of the solar panel is constant.

Keywords : Solar Cell, Tungsten Filament, LED

1. INTRODUCTION

"A **solar cell** (also known as a photovoltaic cell or PV cell) is defined as an electrical device that converts light energy into electrical energy through the photovoltaic effect. A solar cell is basically a p-n junction diode. Solar cells are a form of photoelectric cell, defined as a device whose electrical characteristics - such as current, voltage, or resistance - vary when exposed to light. Individual solar cells can be combined to form modules commonly known as solar panels. The common single junction silicon solar cell can produce a maximum open-circuit voltage of approximately 0.5 to 0.6 volts. By itself this isn't much - but remember these solar cells are tiny. When combined into a large solar panel, considerable amounts of renewable energy can be generated" [1].

A solar cell is really a junction diode, but its creation differs slightly from that of standard p-n junction diodes. A very thin layer of p-type semiconductor is added on top of a heavier n-type semiconductor. A few fine electrodes are placed on top of the p-type semiconductor plate [2]. These electrodes should not block the thin p-type sheet. A p-n junction exists just underneath the p-type layer. The bottom of the n-type layer also has a current-collecting electrode. We encase the full cell in thin glass to protect the solar cell from mechanical blow [3].



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TO STUDY AND COMPARISON OF SOUND INTENSITY AT DIFFERENT PLACES.

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Abstract: Sound intensity level is different at different places. Now days there are different types of Sound meter is available for measuring Sound intensity level. We study & compare the sound intensity level in Decibel (dB) at different places such as Hill Station, Bus Stand, Sugar factory, Market & School. All these places are from Someshwarnager which is in Baramati taluka & district of it is Pune. Sound intensity level is high at Some places & some places it is low. Comparison of Sound intensity level at different places clearly shows by graph

Index Terms - Sound Intensity Meter, Decibel (dB)

I. INTRODUCTION

A useful quantity for describing the loudness of sounds is called **sound intensity**. In general, the intensity of a wave is the power per unit area carried by the wave. Power is the rate at which energy is transferred by the wave. In equation form, intensity / is $I=P/A$, where P is the power through an area A . The SI unit for I is W/m^2 . The intensity of a sound depends upon its pressure amplitude. Sound intensity level is varied with places & sound meter is use for measuring this level. At every place of sound intensity is different, so measuring it we got the information about Sound intensity level.

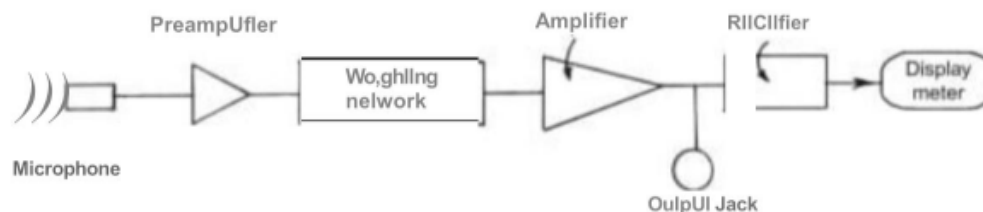


Fig.I. block diagram of sound meter

II. WORKING OFSOUND METER

There square measure two basic ways that of chase and measurement noise pollution: sound level meter measurements and noise mapping calculations with legendary acoustic sound power of sound sources (traffic, industrial plants, etc.). dIe necessity that measurements be densely sampled to get the whole coverage of a selected space will be quite difficult once mistreatment the sound level meter. The sound level meter consists ofa tag mike, electronic circuits, and a show. The mike detects tiny atmospheric pressme variations related to sound and converts them into electrical signals. The signals mentioned on top of square measure then processed mistreatment the instrument's electronic equipment. The shows the sound level in decibels.

ID. APPLICATIONS OFSOUND METER

There are many different applications for Sound level meters

1. Noise at Work & Occupational Noise.
2. Environmental & Community Noise.
3. Testing of fire alarms, simple noise level checks in offices, machinery noise verification.



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Extraction, Purification and Characterization of Alkaline Protease from *Bacillus thuringiensis*

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Abstract

This investigation was carried out to purify & characterize alkaline protease from *B. thuringiensis* & to optimize the conditions for maximum production of extracellular protease. The enzyme was purified by using Ammonium Sulphate Precipitation & Dialysis. The enzyme was characterized through kinetic studies by studying the effect of varying pH, temperature, different Metal ions, Carbon & Nitrogen sources and varying NaCl concentration. This study has also investigated effect of Activator & Inhibitor on enzyme activity and determined the kinetic parameter of alkaline protease. Purified alkaline protease showed maximum saturation at 80%. Optimum pH for enzyme activity was found to be 8. Temperature range of 30°C to 60°C showed the highest activity of enzyme. Alkaline protease was strongly activated by $MnSO_4$ and inhibited by $AgNO_3$. To study the application of alkaline protease one laboratory-based experiment was also carried out by applying alkaline protease on goat skin for dehairing. The best result was obtained, when goat skin was treated with crude enzyme in combination with Glycine -NaOH buffer at pH 10. The enzyme showed excellent dehairing property when applied on goat skin without causing any damage to skin which determined its commercial importance in leather industry. Along with dehairing, it also improved tensile strength of goat skin.

Keywords: *B. thuringiensis*, alkaline protease, Extraction, Purification, Characterization, media optimization, Dehairing, Goat skin.

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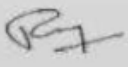
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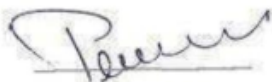
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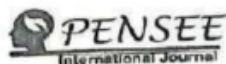
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