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Effect of Sintering Temperature on Structural, Morphological, and Magnetic Properties of Nickel Ferrite Prepared via a Polyol Method

Rajendra P. Patil, Mahendra B. Waghmare, Vilas M. Kalantre, Mohan R. Kadam, Milind G. Chikalkar, and Sagar D. Delekar*

The effects of sintering temperature on the structural and magnetic properties of polycrystalline nickel ferrite synthesized by the novel polyol method are investigated. The effects of heat treatment temperature on crystalline phases formation, microstructure, and magnetic properties of Ni ferrite are investigated by x-ray diffraction (XRD), thermogravimetric, and differential thermal analysis, scanning electron microscopy, transmission electron microscopy, Fourier-transform infrared spectroscopy (FT-IR), and B-H loop tracer technique. The XRD plot of the powder samples sintered at different temperature shows increase in the peak intensity values with respect to temperature of sintering thereby showing an increasing crystallinity of the samples with an increasing sintering temperature. FT-IR spectra for sample sintered at 773 K shows two sharp bands on octahedral and tetrahedral sites. Scanning electron micrographs show spherical and uniform grains which is observed on sintering temperature 773 K. Particle size of nickel ferrite is in the range of 11–15 nm, and depends on the sintering temperature and sintering time. The saturation magnetization increased from 23.45 to 45.61 emu g^{-1} and coercivity increases from 327.27 to 1097.03 Oe with an increase in particle size.

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1. Introduction

Ferrites having spinel structure (AB_2O_4), are found to have technological and commercial applications in electric, magnetic, and catalytic fields because of very interesting structural, electrical, and magnetic properties.[1–4] These properties are tunable with chemical composition, method of preparation, sintering temperature, sintering time, etc.[3] and also, all above applications of ferrites were depending upon the nature, oxidation state and distribution of metal ions over tetrahedral and octahedral sites of spinel lattice. The structural and magnetic properties of these ferrite systems with respect to different sintering temperature conditions have been reported by many researchers.[5–7]

Earlier researchers ferrites prepared by a ceramic method and these method involve high-temperature synthesis for the completion of solid-state reaction between the constituent oxides or carbonates. The particles obtained by this method are rather bigger and non-uniform in size. These non-uniform particles, on compacting, result in the formation of voids and subsequently the low density ferrites. In order to overcome these difficulties, wet chemical methods viz., co-precipitation, citrate gel, and combustion etc. have been used for production homogeneous, fine and reproducible ferrites.[8–16] In our previous work [17,18] this method was employed to obtain improved powder characteristics, better homogeneity and narrow particle size distribution, thereby influencing structural, electrical and magnetic properties of spinel ferrites.

Recently, we have developed new polyol method to prepare mixed metal oxide products on large scale, because of such method particles obtained in between nano range at lower sintering temperature as compared to earlier research work. Polyol method is one of promising methods, which furnish homogeneous, ultrafine particles in narrow size distribution and also, it require low calcination temperature. Literature survey shows that there are no reports on effect of sintering temperature on structural and magnetic properties of the nanocrystalline nickel ferrite prepared by polyol method. Nickel ferrite is a soft magnetic material, which has versatile applications due to its typical


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CONTENTS

Gas Sensing Application of Ceria, Cassiterite and Ceria-Cassiterite Nanocomposite

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Abstract

Ceria, Cassiterite and Ceria-Cassiterite nanocomposites are studied as potential candidates for gas sensors. The particles of CeO_2 core and SnO_2 shell nanocomposite were prepared by microwave method. X-ray diffraction and transmission electron microscopy were used to characterize the CeO_2, SnO_2 and CeO_2/ SnO_2 core shell nanocomposites. The obtained results from XRD show that the CeO_2 nanoparticles coated on SnO_2 yields diffraction peaks correspond to the crystalline SnO_2 phase. Also, TEM results show that the nanocomposite particles have a spherical morphology and a narrow size distribution. The thickness of CeO_2 shell on the surface of SnO_2 particles was about 7 nm. The particle size of the CeO_2 and SnO_2 and their nano composite is in the range of 10-20 nm. The electrical resistivity is decreasing with increasing temperature for all the samples. This indicates that all the samples show semiconductor like behavior.

The present work describes the gas-sensing performance of the nanostructured CeO_2, SnO_2 and CeO_2-SnO_2 powder towards ethanol, LPG, H_2, CO_2, NH_3 andCl_2. It was found that the material exhibits high selectivity and sensitivity towards 60 ppm LPG at the operating temperature of 150^oC.

Keywords: Ceria, cassiterite, nanocomposite, gas sensors, PPM.

Introduction

Gas sensors based on metal dioxide and their nanocomposites have attracted much public attention during the past decades due to their excellent potential for applications in environmental pollution remediation, transportation industries, personal safety, biology and medicine[1-3].

Numerous efforts have therefore been devoted to improving the sensing performance of metal oxides. In those effects, the construct of nanoheterostructures is a promising in gas sensing modification which shows superior sensing performance to that of the single component based sensors. Since the 20th century, atmospheric pollution has been proved to be one of most urgent issues. For the sake of controlling the exhaust emissions, gas sensors for the quantitative detection of various toxic and harmful gases have been widely developed as a result of their high response, outstanding selectivity, excellent repeatability and good stability[4–6].

So far a variety of gas sensors such as metal oxide semiconductor-based gas sensors[7-12], solid electrolyte-based gas sensors[13], electrochemical gas sensors[14], carbon-based gas sensors[15–17], organic gas sensors[5,6] and so on have been extensively investigated.

Amongst these different types of gas sensors, resistance type metal oxide gas sensors offering low cost, simple manufacturing approaches and excellent sensitivity to the great majority of gases have attracted considerable attention during the past several years[18,19].

SnO_2 is a special oxide material because it has a low electrical resistance with high optical transparency in the visible range. SnO_2 owing to a wide bandgap is an insulator in its stoichiometric form. However, due to the high intrinsic defects, that is oxygen deficient SnO_2 is an n-type semiconductor and has many applications. Similarly, CeO_2 is reported to be a predominantly ionic conductor, exhibits n-type conductivity under certain conditions. Cerium dioxide is an inexpensive and relatively harmless material that presents several characteristics that could be potentially advantageous for gas sensing applications. SnO_2 and CeO_2 nanomaterials reveal that they are promising materials for optoelectronic devices such as solar cells, conductive layers and transistors.

In this study, we briefly summarize and highlight the development of CeO_2, SnO_2 and CeO_2-SnO_2 based heterostructure gas sensing materials with diverse models, including semiconductor/semiconductor nano-heterostructures, which have been investigated for effective enhancement of gas sensing properties through the increase of sensitivity, selectivity and stability.

Also, we report the synthesis, characterization and gas sensing of CeO_2, SnO_2 and CeO_2-SnO_2 novel microwave system and describe the gas-sensing performance of the nanostructured CeO_2, SnO_2 and CeO_2-SnO_2 powder towards ethanol, LPG, H_2, CO_2, NH_3 andCl_2.

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Effect of Sintering Temperature on Structural and Morphological Properties of Mn-Substituted Lithium Ferrite

Rajendra P. Patil, Prashant N. Nikam, Sarjerao B. Patil, Ramdas K. Dhokale, Vijay S. Sawant, and Satish B. Shelke*

Manganese-substituted lithium ferrite is synthesized by sol–gel method. The sample is sintered at different temperatures in air. Their structural and morphological properties are studied by X-ray diffraction, scanning electron microscopy, and FT-IR techniques. The X-ray diffraction patterns reveal that all the samples consist of nanocrystalline single cubic phase structure. The morphological studies of synthesized nanocrystalline samples are obtained from the scanning electron microscopy technique. It can be seen that, the average grain size is increased significantly with increasing the sintering temperature. FT-IR studies indicate that the spinel phase formation takes place at higher sintering temperature.

1. Introduction

Ferrospinels are widely used in many important components such as microwave devices, magnetric devices, transformer cores, choke coils, high-frequency instruments, data storage, noise filters, and recording heads, as a ferrofluids and catalytic activity due to the interesting physicochemical properties.[1–3] These properties are dependent on the nature of ions and their charge distribution among tetrahedral and octahedral sites. The modifications of the structural and magnetic properties of ferrites are due to substitution of different ions and have been studied by various workers.[4–12]

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Lithium ferrites have been studied and developed for many years because of their structural, electrical, and magnetic properties that provide better applications of scientific and technological interest.[13–17] Lithium ferrite in the spinel phase, $Li_{0.5}Fe_{2.5}O_4$, has a square hysteresis loop, high magnetization, and high Curie temperature. These properties are useful for technological applications such as the development of low-cost materials microwave devices. Many transition metal cations such as Mn, Cr, Co, and Ti can be introduced into the lattice of the magnetic structure, which is useful to various applications.[18–21]

Literature survey shows that there are no reports on effect of sintering temperature on structural and morphological properties of manganese-substituted lithium ferrite prepared by sol—gel method. Sol–gel method is a useful technique as compared to other methods, due to the better homogeneity, smaller particle size, and modification of surface area. The sol–gel autocombustion technique is an effective method for the synthesis of the mixed-metal oxides. In present investigation, an attempt is made to prepare manganese-substituted lithium ferrite, by sol–gel route.

2. Experimental Section

2.1. Synthesis Technique

Polycrystalline sample having the general formula, $Li_{0.5}Fe_{1.5}Mn_{1.0}O_4$ was synthesized by sol–gel method as shown in **Figure 1**. High-purity AR-grade ferric nitrate, manganese nitrate, lithium nitrate, and citric acid were used for synthesis. The metal nitrate solutions were mixed in the required stoichiometric ratios in minimum quantity of distilled water. The pH of the solution was maintained between 9 and 9.5 using ammonia solution. The solution mixture was slowly heated around 373 K with constant stirring to obtain a fluppy mass. The precursor powder was sintered at 873 and 973 K for 8 h, then mixed with 2% polyvinyl alcohol as a binder, and uniaxially pressed at a pressure of 8 ton cm^{-2} to form the pellets.

2.2. Characterization Techniques

Thermal analysis of the different compositions of the unsintered Mn-substituted lithium ferrite sample was carried out from the

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Photocatalytic Environmental Remediation of Cassiterite–Titania Nanocomposite

Chandrakant B. Mane, Ramkrushna P. Pawar, Rajendra P. Patil,* and Sarjerao B. Patil

Nanocrystalline cassiterite (SnO_2), titania (TiO_2), and cassiterite–titania (SnO_2–TiO_2) are synthesized by microwave method. X-ray diffraction study reveals that cassiterite properly supported on the surface of titania. Nano sized cassiterite, titania, and cassiterite–titania nanocomposite are confirmed by transmission electron microscopy technique. The particle size of the SnO_2, TiO_2, and their nanocomposite is in the range of 12–18 nm. The enhanced photocatalytic activity is observed in the SnO_2–TiO_2 composite as compared to SnO_2 and TiO_2.

1. Introduction

The textile dyes and dye intermediates with high aromaticity and low biodegradability have emerged as major environmental pollutants and nearly 10–15% of the dye is lost in the dyeing process and is released in the wastewater which is an important source of environmental contamination. As dyes are designed to be chemically and photolytically stable, they are highly persistent in natural environments. The improper handling of hazardous chemicals in textile water also has some serious impact on the health and safety of workers putting them into the high-risk bracket for contracting skin diseases like chemical burns, irritation, ulcers, etc., and respiratory problems.[1–5]

Photocatalytic degradation using solar radiation is a potential technique for the removal of the organic contaminants from water. Photocatalytic reactions at the surface of metal oxide have been attracting much attention in view of their practical applications to environmental cleaning. Metal oxide represents an effective photocatalyst for water purification and for self-cleaning surfaces. Additionally, it can be used as antibacterial agent because of strong oxidation activity and superhydrophilicity.[6] Photocatalysts like TiO_2, Al_2O_3, CdS, WO_3, ZrO_2, and V_2O_5 have been investigated for the treatment of these effluents with the aim of mineralizing the dyes completely.[7,8] When photocatalysts are dispersed on other oxides, its surface area increases and it can lead to enhanced photocatalytic activity. The increased activity was attributed to the increased surface acidity of the mixed oxide.

TiO_2 is a high band gap semiconductor that is transparent to visible light and has excellent optical transmittance. The American Food and Drug Administration has approved the use in human food, drugs and cosmetics, and compounded in food contact materials such as cutting board and other surfaces in contact with unprotected food.[9] For photovoltaic applications, TiO_2 photo-catalyst is effective in solar light or light from visible region of the solar spectrum need to be developed as future generation photo-catalytic material.[10] TiO_2 has high refractive index and good insulating properties and as a result it is widely used as protective layer for very large scale integrated circuits and photovoltaic cells as well as antireflective coatings, gas sensors, electro-chromatic displays and planar waveguides.

SnO_2 is a special oxide material because it has a low electrical resistance with high optical transparency in the visible range. Due to these properties, apart from gas sensors, SnO_2 is being used in many other applications, such as electrode materials in solar cells, light-emitting diodes, flat-panel displays, and other optoelectronic devices where an electric contact needs to be made without obstructing photons from either entering or escaping the optical active area and in transparent electronics, such as transparent field effect transistors.[11,12] SnO_2 owing to a wide bandgap is an insulator in its stoichiometric form. However, due to the high intrinsic defects, i.e., oxygen deficiencies, tin also, SnO_2 is an n-type semiconductor and has many applications.

TiO_2 and SnO_2 nanomaterials reveal that they are promising materials for optoelectronic devices due to its excellent electrical and optical properties. The observed photocatalytic activity of the composite was correlated with the proper microstructure of this composite and the isolation function of the supporting layer. In the present work, we report the synthesis, characterization and photocatalytic activity of SnO_2, TiO_2 and SnO_2–TiO_2 novel photocatalytic system. With this aim, SnO_2, TiO_2 and SnO_2–TiO_2 nanocomposite has been synthesized and studied its

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Microstructure and Magnetic Properties of Ni-Mg-Zn-Co Ferrites

Sarjerao B. Patil,* Anil J. Davari, Devidas R. Patil, and Rajendra P. Patil

Preparation of Ni-Mg-Zn-Co ferrites having general formula $Ni_{0.5-x}$ $Mg_{x-0.01}$ $Zn_{0.5-y}$ $Co_{y+0.01}$ Fe_2O_4 (where $x = 0.1, 0.2, 0.3, 0.4$ and $y = 0.1, 0.2, 0.3, 0.4$) is carried out by conventional ceramic method. The X-ray diffraction studies of compositions reveal the formation of single-phase cubic spinel. The lattice parameter "a," bond lengths R_A, R_B, and site radii r_A, r_B are found to increase linearly with increase in Zn content. The average grain diameter determined from scanning electron microscopy studies is found to increase with Ni content. The magnetic moment (μ_B) increases on addition of Zn. However, it decreases beyond Zn = 0.4. The lower values of hc and Mr/Ms show the existence of MD particles in the samples. The value of μ_B lie in the range of 0.85 to 1.09 and saturation magnetization (4πMs) varies between 834 and 1115 emu g^{-1}. It is observed that μ_B and Ms increase with Zn content upto Zn = 0.3 and then decrease. The cation distribution is proposed on the basis of site preference energies of the ions. Initial permeability increases slowly to the peak value at a certain temperature and drops abruptly to zero at the Curie temperature. The Curie temperature is found to decrease with increase in Zn content.

1. Introduction

Nickel–Zinc ferrite has found use in electromagnetic applications that requires a high permeability such as inductors and electromagnetic wave absorber.[1] Several workers have studied these ferrites both on basic properties and on the influence of various substitutions depending on the application of interest.[2–4] The spinel ferrites have promising applications in different fields such as nano devices, catalyst, sensors, photoelectric, and microwave devices.[5–7] The properties of the ferrites can be tuned by changing the ions at tetrahedral (A site) and octahedral (B site).[8,9] The usefulness of ferrites is influenced by the physical and chemical properties of the materials and depends on many factors including the method of preparation.

Magnetic properties of spinel ferrites can be discussed on the basis of magnetic parameters such as saturation magnetization, magnetic moment, retaintivity, coercivity, magnetic loss, susceptibility, and permeability, etc. The choice of ferrite for an application is based on its magnetic properties. Among the technically important of ferrites are the mixed zinc ferrites with high initial permeability. The magnetic properties of spinel ferrites are strongly dependent on the distribution of the different cations among tetrahedral (A) and octahedral (B) sites in the crystal lattice. Initial permeability (μ_i) is a structure sensitivity property which depends upon method of preparation porosity and grain size. It plays an important role in the materials for various applications. High initial permeability at low frequency is the technological requirement of ferrites. Such ferrites are wildly used in low frequency inductor and transformer cores. Permeability is a structure sensitivity property which mainly depends upon the method of preparation and heat treatment.

It is generally assumed that the initial permeability is caused by the reversible displacement of the domain walls the contribution of rotation of spin inside each domain being negligibly small on account of relatively high anisotropy. In polycrystalline ferrites due to sintering a certain amount of pores are present. These pores have a considerable demagnetizing effect which leads to rather intrinsic pattern of Weiss domain. It is different to say which kind of magnetization process will give the predominant contribution to the initial permeability. This paper focuses discussion on Ni-Mg-Zn-Co ferrite dependence of the magnetic properties on the microstructure influenced and sintering temperature.

2. Results and Discussion

The X-ray diffraction patterns of the samples in the system $Ni_{0.5-x}$ $Mg_{x-0.01}$ $Zn_{0.5-y}$ $Co_{y+0.01}$ Fe_2O_4 where $x = 0.1, 0.2, 0.3, 0.4$ and $y = 0.1, 0.2, 0.3, 0.4$ are shown in Figure 1. The absence of extra line

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हिंदी की प्रभा खेतान की आत्मकथा 'अन्या से अनन्या' एवं मराठी की स्नेहप्रभा प्रधान की आत्मकथा 'स्नेहांकिता' का तुलनात्मक अध्ययन

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प्रस्तावना :

आत्मकथा यह विधा गद्य कथा साहित्य के अंतर्गत आती है। आत्मकथा में लेखक के जीवन से संबंधित घटनाएं आती है। इसमें कल्पना को स्थान नहीं होता। आत्मकथा विधा यथार्थ से जुड़ी हुई होती है। इसलिए जीवन की सच्चाई को जोड़ने वाली यह विधा है। जब कोई व्यक्ति अपनी कहानी लिखने बैठता है, तो वह अकेले की कहानी नहीं लिख सकता। तत्कालीन समाज का चित्रण उसमें आता ही है। क्योंकि व्यक्ति को बनाने का कार्य बाहरी तथा आंतरिक परिवेश भी करता है। इसीलिए तत्कालीन समाज का वर्णन आना स्वाभाविक है।

बीज शब्द : तुलनात्मक, आत्मकथा, स्त्री-अस्मिता, अपराधबोध, साहित्य, समाज, दोयमता

आत्मकथा में लेखक अपने जीवन के अनुभवों को व्यक्त करता है। अपने बीते हुए जीवन को फिर एक बार आत्मकथा के माध्यम से देखता है, या फिर से उसे जीता है और प्रस्तुत करता है। आत्मकथा में यथार्थ को बड़ा महत्व होता है। हिन्दी लेखिका अमृता प्रीतम जी ने आत्मकथा के संदर्भ में लिखा है, "आत्मकथा को लेखक की अपनी आवश्यकता मानते हुए यथार्थ से यथार्थ तक पहुँचने की प्रक्रिया माना है।"1 आत्मकथा में यथार्थ को बड़ा महत्व होता है।

प्रभा खेतान की आत्मकथा 'अन्या से अनन्या' और स्नेहप्रभा प्रधान की आत्मकथा 'स्नेहांकिता', इन दो आत्मकथाओं का तुलनात्मक अध्ययन इस शोध आलेख में प्रस्तुत किया है। आत्मकथा द्वारा दोनों लेखिकाओं का व्यक्तित्व पाठकों के सामने रखना इस शोध आलेख का उद्देश्य है।

प्रभा खेतान की आत्मकथा 'अन्या से अनन्या':

'अन्या से अनन्या' के माध्यम से प्रभा खेतान ने पाठकों के सामने अपना अंतरंग खोल कर रख दिया है। प्रभा खेतान पीएच.डी. शिक्षा लेकर अपने बलबूते पर सफल व्यवसायी तथा साहित्यकार बनती है।

'अन्या से अनन्या' बोल्ड आत्मकथा मानी जाती है। यहां लेखिका एक ऐसे डॉक्टर से प्रेम करने का साहस करती है, जो न केवल उम्र में उनसे दुगुना है, बल्कि शादीशुदा एवं 5 बच्चों का पिता भी है। प्रभा खेतान की 'अन्या से अनन्या' यह आत्मकथा एक बेमिसाल रचना है। अपनी आत्मकथा द्वारा प्रभा जी ने नारी को अबला के कटघरे से निकालकर आधुनिक स्वयंपूर्ण नारी के निर्माण पर बल दिया। अपनी अस्मिता की रक्षा और स्व की पहचान के साथ पितृसत्ताक समाज से मुक्ति पाना स्त्री के लिए आवश्यक है। प्रभा जी ने अपनी आत्मकथा के माध्यम से यह अधोरेखित किया है कि औरत को प्यार के साथ धन-मन और अभिव्यक्ति स्वातंत्र भी चाहिए। प्रभा जी ने बचपन से अपने आसपास के स्त्रियों को रोते हुए देखा था। इसलिए प्रभा जी ने निश्चय किया था कि, भविष्य में कभी नारी की आँसू भरी जिंदगी नहीस्वीकारेगी। वैसेही जीवन मे आई उलझनों को स्वयं सुलझाते हुए प्रभा जी ने अपनी जमीन स्वयं तलाश की। इस संदर्भ में आत्मकथा में वह लिखती है कि "हाँ, उन तमाम उलझनों के बीच में मैंने एक बेहतर भविष्य का सपना देखना नहीं छोड़ा। मैं हमेशा मानती हूँ कि व्यक्ती अपने सपनों के सहारे काफी कुछ पा सकता है।" 2 उसे पुरुष की तरह बराबर की जमीन की आवश्यकता है। समाज यह जमीन स्त्री को स्वेच्छा से नहीं देता। इसलिए उसे अपनी जमीन खुद तैयार करनी पड़ती है।

स्त्री चाहे अपने आप को कितनी ही बोल्ड कहे, पर समाज से कटकर नहीं रह पाती। समाज में विवाह के परंपरागत रूप को ही मान्यता मिलती है। भारतीय समाज में विवाह के सात फेरों को बड़ा महत्व है, लेकिन प्रभा जी ने विवाह नहीं किया। विवाह किए बिना डॉक्टर सर्राफ को तन-मन दोनों दिए। डॉक्टर सर्राफ की ओर से प्रभा जी के साथ का रिश्ता उतनी प्रामाणिकता से नहीं

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Importance Of Livestock Product In India

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Abstrac:-

Indian livestock enterprises are important sector of food production and improve the human nutritional status and also livestock in an important capital asset in Indian economy many farmers depends on animal husbandry. So Animal husbandry is important role rural economy. The livestock can be divided two parts on is Fishers and another in Animal Husbandry. Animal Husbandry is vital role in economy so we discuss the Animal Husbandry in the article.

At present position more than 50 percent of our total agriculture income in derived from cattle, mostly in the form the cattle labour. And also India is first in the total buffalo population in the world 109. 85 million buffalos.

Keywords: Livestock, nutritional status, farmers, Animal Husbandry, Economy

Introduction:-

Livestock enterprises are play important role in rural economy. Many farmers depend an animal husbandry for their livelihood. India has the world's largest livestock population. And also, India is the first in total buffalo population in world. In economy it is not easy to examine the monetary value as cattle's contribution to the national income. At present position more than 50 percent of our total agricultural income is derived from cattle labour[1].

Indian economy is rural economy. Approximately 70 percent population is direct and indirect depends in agricultural. And also animal husbandry is important in agricultural sector. The Livestock production sector is globally increasing in India .

Objectives of the study:-

1. To know the growth in the livestock population in India.
2. To analysis the trends in livestock population.
3. To present the concluding remarks.

Data Base and methodology: -

This study depends on secondary data. This article is descriptive study based on the secondary data .And secondary data collected in various research papers, journals,Books, websites and various reports which is related to Animal Husbandry.

Animal Husbandry in India: -

Ancient times when the man started faming in organized form the demand for draft animals for cultivation was increasingly felt and the domestication of animals started fodder [cattle for other livestock] and crop by – products got increasingly used for animals, milk and draft purposes[1].

In India many farmers depend on animal husbandry for their livelihood, milk, meat, eggs, wool, their castings and hides, animals mainly bullock, are the major source of power for famers. The animal husbandry plays on important role in the rural economy. The gross value of output from this sector was Rs. 358 billion in 1989 and amount that constituted about 25 percent of the total agricultural output of Rs.1.4 billion.[2] (source : en. m. Wikipedia org>wiki>Animal husbandry India - Wikipedia)

In Indian economy historical changes in demand for livestock products. The main reason is rapidly growing human population in India.

The livestock can be divided into two parts as

a) fisheries and b) Animals Husbandry.

we discuss the importance of Animal Husbandry in this article.

Animal husbandry is important role in the overall economy than so for envisaged as an main part a expanding diversified agriculture. Animal husbandry currently accounts for over 25 percent of gross value of agriculture output[1].

Types of livestock[1] :-

In India, livestock population can be classified has given below:-

a) Working livestock.

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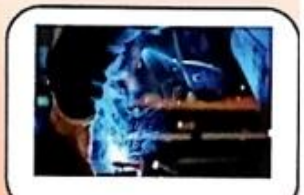

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बौद्ध धर्मांतर: एक रक्तहीन सामाजिक समतेची क्रांती

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प्रस्तावना:

हिंदू धर्मात सामाजिक समता निर्माण करण्यासाठी सामाजिक परिवर्तनाची आवश्यकता होती. पण एकंदरीतच हिंदू समाजरचना पाहता डॉ.बाबासाहेब आंबेडकर यांना व्यवस्था परिवर्तन अपेक्षित होते. कारण हिंदूधर्म हा मनुस्मृती सारख्या विषमतावादी ग्रंथावर आधारित होता. त्यामुळे २५ डिसेंबर, १८२७ रोजी महाड मुक्कामी डॉ. बाबासाहेब आंबेडकरांनी मनुस्मृती या विषमतावादी ग्रंथाचे सामुदायिकरीत्या दहन करून व्यवस्था परिवर्तनाच्या दिशेने पहिले पाऊल टाकले. ज्याची नोंद इतिहासात सुवर्णाक्षरांनी केली गेली.....पण एकंदरीतच हिंदू समाजरचना त्यामधील वर्णव्यवस्था, जन्माधिष्ठित जातीव्यवस्था आणि श्रमविभागणी बरोबरच उच्च-नीच, श्रेष्ठ-कनिष्ठ अशी सामाजिक उतरंड लक्षात घेता हिंदूधर्म सामाजिक समता प्रस्थापित करू शकेल असे डॉ. आंबेडकरांना न वाटल्याने त्यांनी १३ ऑक्टोबर, १९३५ रोजी येवला (नाशिक) येथे "मी हिंदू म्हणून जन्माला आलो असलो तरी, हिंदू म्हणून मरणार नाही" अशी ऐतिहासिक घोषणा केली.१ आणि धर्मांतराच्या दिशेने पाऊल टाकले. धर्मांतराच्या या घोषणेने संपूर्ण देशांमध्ये खळबळ माजली. पण धर्मांतराची ही घटना भारतास नवीन नव्हती. भारताच्या इतिहासावर नजर टाकली तर आपल्या लक्षात येईल की, भारतात यापूर्वी सुद्धा अनेक धर्मांतरे घडवून आली होती. इ. स. ७ व्या शतकानंतर भारतावर झालेली इस्लामी सत्तेची आक्रमणे आणि त्यातून हिंदूंचे झालेले मुस्लिम धर्मांतर असो, किंवा १९ शतकात ब्रिटिश सत्तेच्या काळात हिंदूंचे झालेले ख्रिश्चन धर्मांतर असो प्रत्येक वेळी धर्मांतराचा प्रवास हा हिंदू धर्मातून इतर धर्मात असाच राहिला आहे. या दोन्ही धर्मांतराच्या पाठीमागे राजकीय सत्ता, भय, लोभ अशी कारणे होती. त्यामुळे त्यास कोणतेही उज्वल भवितव्य नव्हते. मात्र १९५६ साली भारतामध्ये घडून आलेले बौद्ध धर्मांतर हे केवळ आणि केवळ विवेकने झालेले धर्मांतर होते. या धर्मांतराच्या पाठीमागे डॉ. बाबासाहेब आंबेडकर यांची भूमिका ही जगातील प्रत्येक माणसास एकाच समान पातळीवर आणून सामाजिक समता प्रस्थापित करणे ही होती. त्यामुळे त्याची खास नोंद घ्यावी लागते. डॉ. बाबासाहेब आंबेडकर यांनी केलेली ही धम्मक्रांती अत्यंत शांततेने आणि विवेकाने केलेली क्रांती होती. या धम्मक्रांती पाठीमागे राजकीय प्रलोभन किंवा सूडाची भावना नव्हती. आणि म्हणून जगाच्या इतिहासातील सर्वात मोठी रक्तहीन धम्मक्रांती म्हणून तिचा उल्लेख करावा लागतो. माणसाला एका समान पातळीवर आणणारी ती एक समतेची क्रांती होती. प्रस्तुत संशोधनपर निबंधामध्ये अस्पृश्य समाजास असणारी धर्मांतराची आवश्यकता, हिंदूधर्मात संदर्भात बाबासाहेबांची भूमिका, इतर धर्मसंबंधीचे त्यांचे विचार, आणि बौद्ध धर्मच का? या अनुषंगाने डॉ. बाबासाहेब आंबेडकर यांच्या विचारांवर प्रकाश टाकण्याचा प्रयत्न करण्यात आला आहे.

हिंदू धर्मासंबंधी विचार:

डॉ.बाबासाहेब आंबेडकरांनी धर्मांतराची घोषणा केल्यानंतर हिंदूधर्मातून त्यांच्यावर मोठ्या प्रमाणात टीका होऊ लागली. डॉ. आंबेडकर यांना देशद्रोही,धर्मद्रोही ठरवून ते हिंदू धर्म उध्वस्त कराव्यास निघाले आहेत. अशीच समजूत करून घेतली होती. वेगवेगळी वर्तमानपत्रे बाबासाहेब आंबेडकर यांच्या विरोधात आग ओकत होती. बाबासाहेब आज अस्पृश्यांच्या अज्ञानाचा फायदा घेत आहेत. त्यांना बहकावण्याचा प्रयत्न करत आहेत.२ एवढेच नाही तर धर्मांतराने अस्पृश्यांचे अतोनात नुकसान होईल अशा कितीतरी प्रतिक्रिया येत होत्या. काही लोक तर हिंदू

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[illegible]

(Research Paper for International Interdisciplinary Conference Organized by
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Historical Importance of Gaganbavada Taluka in view of local History

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Introduction:

Gaganbavda a town is situated in the district of Kolhapur in Maharashtra, India. It is located 55 km by road from Kolhapur. It is the taluka place. Gaganbavada is situated on the Sahyadri range, on the western Ghats also has a very famous fort Gagangad near it. Gaganbavada, is undeveloped and hilly area place of the district. Gaganbavada gets the heavy rainfall during the rainy season. Gaganbavada is on threshold of famous Karul Ghat & Bhuibavada Ghat. Perhaps the only place having two ghats originating at a single place but going towards different directions, one towards Talere-Kankavali (Karul Ghat) and another towards Kharepatan-Rajapur (Bhuibavada Ghat). The Kolhapur district boundary ends immediately after Gaganbavada and Sindhudurg District starts just at the beginning of Karul Ghat and Bhuibavada Ghat.

In Gaganbavada Taluka now there are 39 villages and people are mostly using of language is Marathi. The Gaganbavada is undeveloped and hilly region. Majority of peoples are economically, socially & educationally condition backward. The Transport facilities are not yet sufficient. Not yet any industrialization in this region, so that we can see lack of opportunities of jobs. The main occupation is farming and the big mob is engaged in farm work. The advantages of Gaganbavada Taluka are a natural beauty and it has risen up to tourist place in Maharashtra. Due to this natural beauty Gaganbavada Taluka also known as a Mini Mahabaleshwar. But in another view Gaganbavada has an ancient history. This area or region actually belongs to

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Biodiversity of Gaganbavada Taluka: Study and Applications of its Geographical View

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Abstract:

Gaganbavada is situated in Kolhapur District of Maharashtra state, India. It is Taluka place, situated in the Sahyadri Range. The most of the area of this place is covered by mountains, valleys, and forest. There are very few areas covered by agriculture. This is also heavy rain fall place in Maharashtra. Gaganbavada Taluka has rich biodiversity because there is no industrialization yet today. There are three major dams such as Kode, Andur, and Vesari Dam. The surrounding area of dams is covered by green and huge forest. There are numbers of medical plants, trees as well as we can also see the various types of wild animals and birds which is becoming great attraction of tourist and researchers. There are numerous types of diversity of flora and fauna. For nature extremists Gaganbavada has many surprises. More than [illegible] species of birds, 50 species of butterflies, 21 species of mammals inhabit the forests of Gaganbavada. These forests are [illegible] medical plants and herbs. In short, though rich in biodiversity Gaganbavada has remained a backward [illegible] hence it should be given special status and efforts to be directed for its development.

Introduction

Gaganbavada Taluka is situated in the district of Kolhapur, Maharashtra state, India. It is placed 55 km from Kolhapur by road. It is Taluka Place of Kolhapur district. Gaganbavada situated in the Sahyadri range of the Western Ghats. In the Gaganbavada has a very famous historical fort name is Gagangad. Gaganbavada has an ancient history, this area or region actually belongs to Chalukya Empire of Badami. We can see more evidences related to Chalukya Empire. Gagangad fort is also witness of Maratha History and various political events which was related to the Kolhapur State. So these historical places and sources are more valuable in view of history. Gaganbavada is hilly area place of the district. Gaganbavada gets heavy rainfall during the rainy season. The advantage of Gaganbavada Taluka has natural beauty and it has risen up tourist place in Maharashtra. Due to this natural beauty Gaganbavada Taluka also known as Mini Mahableshvar. Gaganbavada is on threshold of famous Karul Ghat and Bhuibavada Ghat. Perhaps, the only place having two Ghats originating at a single place but going towards Kharepatan-Rajapur, Sindhudurg Distrct. Gaganbavada Taluka is backward in view of socially and economically but environmentally rich place in Kolhapur district. There are rich diversity of flora and fauna. In this area various numbers of trees such as Jamun, Jackfruit Cashew, Mango, BlackBerry.etc. There are also some beautiful places like Ramling caves, Dams, Mountain and valleys as well as green forestry. In short this place has a natural beauty and great biodiversity but it's remained backward due to lack of transport facilities. Hence it should be given a special status and efforts being directed for its development. The present research paper is to focus on the importance of Gaganbavada Taluka in view of biodiversity and ecotourism.

Objective of the study:

The objective of the present study is to introduce the following importance of Gaganbavada Taluka:

- To study of various flora and fauna.
- To emphasis on wild animals, birds, etc.
- To attention on climate, crops, lands, etc.
- To focus of rivers and forest.

Hypothesis:

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समकाळाचे सांविधानिक भान असणारा लेखक : शरणकुमार लिंबाळे

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प्रास्ताविक :

शरणकुमार लिंबाळे हे स्वातंत्र्योत्तर काळात निर्माण झालेल्या मराठी दलित साहित्यप्रवाहातील महत्वाचे कवी, लेखक, आत्मकथनकार व समीक्षक म्हणून परिचित आहेत. त्यांचा जन्म सोलापूर जिल्ह्यातील हन्नूर या गावी झाला. त्यांचे प्राथमिक शिक्षण हन्नूर या गावी तर माध्यमिक शिक्षण चुंगी, चपळगाव या ठिकाणी झाले. बी.ए .ची परीक्षा उत्तीर्ण झाल्यानंतर त्यांना एम. ए.चे शिक्षण घ्यायचे होते. परंतु या दरम्यानच्या काळात त्यांना अहमदपूर(जि. लातूर) येथे टेलिफोन खात्यात नोकरी मिळाल्याने त्यांचे एम.ए. चे शिक्षण त्यावेळी पूर्ण होऊ शकले नाही आकाशवाणी सोलापूर केंद्रात नोकरी करत असताना दयानंद महाविद्यालयाचे प्राचार्य बनसोडे यांच्या आग्रहाखातर त्यांनी पदव्युत्तर शिक्षण पूर्ण केले. पुढे प्राध्यापक होण्यासाठी ते 'नेट' परीक्षाही उत्तीर्ण झाले. परंतु बी .ए.ला क्लास नसल्यामुळे अधिव्याख्याता पदाच्या मुलाखतीमध्ये ते अपात्र ठरले. त्यानंतर डॉ. ल . रा .नसिराबादकर यांच्या मार्गदर्शनाखाली शिवाजी विद्यापीठ, कोल्हापूर येथून त्यांनी 'दलित साहित्याच्या समीक्षेचा चिकित्सक अभ्यास' या विषयावर संशोधन पूर्ण करून पीएच.डी. ही पदवी प्राप्त केली. पुढे ते यशवंतराव चव्हाण मुक्त विद्यापीठ, नाशिक येथे प्राध्यापक व विविध केंद्राचे संचालक म्हणून कार्यरत राहिले.

शरणकुमार लिंबाळे यांनी विविध प्रकारात मुबलक लेखन केले आहे. त्यांच्या सर्वच कलाकृतींमधून समाजातल्या तमाम विषमतेविषयीची वास्तवदर्शी चित्रणे आलेली आहेत.आपण कार्यकर्ता लेखक असल्याचे ते मान्य करतात कारण चळवळीनेच आम्हाला लिहायला शिकवले, अस्मिता कळाली. डॉ.बाबासाहेब आंबेडकर यांच्यामुळे एक नवी ऊर्जा मिळाल्याचे त्यांच्या साहित्यातून चित्रित होते. त्यामुळेच चळवळ व साहित्य ही एकमेकांना पूरक असायला हवीत ही भूमिका ते घेतात. त्यांनी विद्यार्थी दशेपासून 'दलित पंथर' या चळवळीत सहभाग घेतला. 'नामांतर ' आंदोलनात ते सक्रिय कार्यकर्ते राहिलेले आहेत. यातूनच त्यांच्या लेखनास बळ मिळाले. एकुणच त्यांचे समग्र लेखन आंबेडकरी विचार प्रेरणेतून आविष्कृत झाले आहे.

शरणकुमार लिंबाळे यांची ग्रंथसंपदा : **कवितासंग्रह** - उत्पात, श्वेतपत्रिका, धुडगूस, **कथासंग्रह** - हरिजन, रथयात्रा, उद्रेक, **कादंबरी** - उपल्या , भिन्नलिंगी , हिंदू , बहुजन, झुंड , दंगल , रामराज्य , ओ **आत्मकथन** - अक्करमाशी , बारामाशी आणि राणीमाशी **समीक्षा** - साहित्याचे निकष बदलावे लागतील ,ब्राह्मण्य ,दलित आत्मकथा एक आकलन, दलित साहित्याचे सौंदर्यशास्त्र , वादंग **संपादने** -

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१. स्त्री-पुरूष समतेचे पुरस्कर्ते डॉ. बाबासाहेब आंबेडकर

प्रा. अजित दादू फाळके
सहायक प्राध्यापक, हिंदी विभाग, म. ह. शिंदे महाविद्यालय, तिसंगी.

पुरूषप्रधान भारतीय संस्कृतीमध्ये समाजात पुरूषांता मानाचे स्थान असून स्त्रिला दुय्यम स्थान आहे. डॉ. बाबासाहेब आंबेडकरांचा जन्म अशा काळात झाला ज्या काळात, ज्या परिस्थितीत जो काळ भारतीय समाज व्यवस्थेच्या दृष्टिकोणातून अतिशय भयंकर होता. माणसाला माणसासारखे जगण्याचे हक्क नाकारणारा माणसामाणसात विषमतेची जाती व्यवस्था निर्माण करणारा, स्वातंत्र्य, समता, बंधुता या तत्त्वांना कोठेही स्थान नसणारा असा हा मनुस्मृतीचा कालखंड होता. या काळात समाजात वर्णव्यवस्था अस्तित्वात होती. समाज हा चार वर्गात विभागला गेला होता. ब्राह्मण, क्षत्रिय, वैश्य आणि शुद्र याशिवाय आणखी एक वर्ग 'होता तो म्हणजे अतिशुद्र.' या वर्गाबरोबरच स्त्रियांची स्थिती देखील चिंताजनक होती. भारतीय स्त्री ही समाज व्यवस्थेची अविभाज्य घटक असून ती अस्तित्व शून्य होती. प्रस्तापित व्यवस्थेत तिला देव, धर्म, प्रथा, परंपरा या नावाखाली अनेक बंधनात अडकून ठेवले होते. स्त्रिला शिक्षण, आर्थिक अधिकार, राजकीय, सांस्कृतिक आणि धार्मिक अधिकारापासून वंचित ठेवले होते.

भारतीय पितृसत्ताक समाजव्यवस्थेत स्त्रियांना हीन मानले जात होते. स्त्री म्हणजे पातळ, स्त्री म्हणजे गुलाम. स्त्री म्हणजे नरकाचे द्वार, स्त्र म्हणजे पापाचे भांडे, वासनेचे घर अशा कितीतरी प्रकारे स्त्री ची ओळख धर्मग्रंथानी करून दिली. स्त्री म्हणजे दुसऱ्याचे धन. स्त्री चा जन्म हा शोषण करण्यासाठीच आहे अशी धारणा समाजात होती. कौंटुंबिक जीवनात अनेक संकटाचा सामना स्त्रियांना करावा लागत होता. स्त्रियांच्या उद्धारासाठी महात्मा फूले, महर्षि कर्वे, शाहू महाराज, राजाराम मोहन रॉय, इत्यादी समाज सुधारकांनी कार्य केले. परंतु स्त्रियांच्या मुक्तीसाठी सर्वात प्रथम प्रयत्न केला तो महात्मा जोतिराव फुले आणि सावित्रीबाई फुले यांनी 'जिच्या हाती पाळण्याची दोरी तीच जग उद्धारी' म्हणून फुले दांपत्यांनी स्त्री शिक्षणाचा पाया घातला. याच स्त्रियांना कायद्याने त्यांचे हक्क आणि अधिकार देऊन डॉ. बाबासाहेबांनी आपल्या गुरूचे अपूर्ण क्रम पूर्ण केले.

डॉ. बाबासाहेब आंबेडकर स्त्री-मुक्तीचे कट्टर समर्थत होते. त्यांच्यावर महात्मा गौतम बुद्धांच्या शिकवणूकीचा व जोतिबा फुलेंच्या कार्याचा प्रभाव जास्त होता. भारतातील शुद्राच्या स्थितीविषयी डॉ. बाबासाहेब आंबेडकर ज्यावेळी विचार करत. त्याचवेळी भारतातील स्त्रीच्या सामाजिक स्थिती विषयी बारकाईने अभ्यास करत होते. बाबासाहेबांच्या मते कोणत्याही समाजाचे मूल्यमापन त्या समाजातल्या स्त्रियांची परिस्थिती कशी आहे यावरून करता येते. स्त्रियांच्या विकासाकडे लक्ष केंद्रित करणे यासाठी ते आग्रही होते. मनुस्मृतीने स्त्रियांना गुलाम बनविले त्याच मनुस्मृतीने तिला पातळ ठरविले याची बाबासाहेबांना जाणीव होती. म्हणूनच बाबासाहेबांनी स्त्रियांच्या उद्धारासाठी २४ डिसेंबर १९२४ रोजी महाड

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GREEN SYNTHESIS AND CHARACTERIZATION OF FE AND AG CORE-SHELL BIMETALLIC NANOPARTICLES WITH THE HELP OF *LAUNEA PROCUMBENS*

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ABSTRACT

Core shell bimetallic ferrous and silver bimetallic nanoparticles were synthesized using aqueous leaf extract of *Launea procumbens*. Initially, Fe nanoparticles were obtained by using plant extract, with $FeSO_4$ as precursor salt, and thereafter $AgNO_3$ was added for the formation of shell on it without the help of plant extract. The Fe-Ag NPs thus prepared were characterized by UV-visible Spectroscopy, Transmission Electron Microscopy (TEM) and Fourier Transform Infrared (FT-IR) Spectroscopy.

Key words: core shell bimetallic nanoparticles, *Launea procumbens*, leaf extract, characterization

Introduction:

Nanoparticles (NPs) are the particle with the size ranging from 1-100 nm[3]. At the beginning, the scientists focused on the synthesis and application of NPs prepared by using a single metal (monometallic nanoparticles). Thereafter they successfully designed hybrid NPs comprising of two metals, popularly known as bimetallic NPs. Bimetallic NPs are generally categorized as core-shell, hetero-structure, inter-metallic or alloyed nanostructures (Nair et. al., 2007; Yang et. al., 2014; Sun et. al., 2000). The core shell bimetallic NP, composed of two different metal elements is a combination of core (inner material) and a shell (outer layer material) as per the opinion of Pelton et. al., (2008). Such nanostructures are of special in the fields of optics, magnetism, electronics, catalysis, anticorrosion etc. (Connell et. al., 2000)

Ferrous-Silver nanoparticles (Fe-Ag NPs) are used in fields of medicine, pharmaceuticals, and electronics (Mittal et. al., 2013), decontamination of ground water, catalysis (Muradova et. al., 2016), photo-thermal cancer therapy (Jeon et. al., 2013). However very little information is available on the bio-synthesis of core shell nanoparticles using plants extracts.

Launea procumbens (Family Asteraceae) is a leafy wild medicinally important vegetable. The leaf extract of this plant containing aldehyde and ketone compounds (alkaloids, flavonoids and phenols), which could be used as reducing and stabilizing agents.

Present investigation deals with *in-situ* synthesis of Fe-Ag core shell NPs using *Launea procumbens* aqueous leaf extract, which has not been yet reported. In order to confirm the nature of bimetallic NPs, its characterization was undertaken using the tools, such as transmission electron microscopy (TEM), UV-vis spectroscopy, Fourier transform infrared spectroscopy (FT-IR).

Material and methods:

The leaves of *Launea procumbens* were collected from and around Kolhapur (Maharashtra, India) city, brought to the laboratory, washed using tap water and shade

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Flexible and disposable gold nanoparticles-N-doped carbon-modified electrochemical sensor for simultaneous detection of dopamine and uric acid

Aniruddha B Patil [1], Chuanbao Zheng, Lryun Ma, Ronghui Wu, Sharwari K Mengane, Yifan Zhang, Xiaotian Liu, Zhaohui Meng, Wenli Zhang, Zijie Xu, Caifeng Chen, Jiani Huang, Xiang Yang Liu

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Abstract

Catalytic and electrocatalytic applications of supported metal nanoparticles are hindered due to an aggregation of metal nanoparticles and catalytic leaching under harsh operations. Hence, stable and leaching free catalysts with high surface area are extremely desirable but also challenging. Here we report a gold nanoparticles-hosted mesoporous nitrogen doped carbon matrix, which is prepared using bovine serum albumin (BSA) through calcination. BSA plays three roles in this process as a reducing agent, capping agent and carbon precursor, hence the protocol exhibits economic and sustainable. Gold nanoparticles at N-doped BSA carbon (AuNPs@NBSAC)-modified three-electrode strip-based flexible sensor system has been developed, which displayed effective, sensitive and selective for simultaneous detection of uric acid (UA) and dopamine (DA). The AuNPs@NBSAC-modified sensor showed an excellent response toward DA with a linear response throughout the concentration range from 1 to 50 μM and a detection limit of 0.05 μM. It also exhibited an excellent response toward UA, with a wide detection range from 5 to 200 μM as well as a detection limit of 0.1 μM. The findings suggest that the AuNPs@NBSAC nanohybrid reveals promising applications and can be considered as potential electrode materials for development of electrochemical biosensors.

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Abstract

The discovery of green nanoparticles (GN) has fascinated scientific community and has significantly improved in recent years. GN exhibited appealing applications in various fields such as catalysis, energy harvesting, and electrocatalysis. The performance of nanoparticles is interrelated with their singular features, which mainly relied on size and shape. In-depth knowledge of synthetic materials engineering and assembly dynamic is highly beneficial for discovering new protocols for the fabrication of nanoparticles with tunable properties. This chapter is focused on the different synthetic techniques reported for the synthesis of GNs, which mainly cover monometallic nanoparticles, bimetallic nanoparticles, and metal oxide nanoparticles. Different synthesis techniques that demonstrated for the desired performance or performance enhancement of nanomaterials have been discussed in a

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DESIGNING AND BIOLOGICAL PREDICTION STUDY OF SOME 4-PHENYL-6 (SUBSTITUTED-PHENYL)-[1,3,5]TRIAZIN-2-YLAMINE/-OL/-THIOL DERIVATIVES AS POTENT PHOSPHODIESTERASE II INHIBITOR, UBIQUINOL-CYTOCHROME-C REDUCTASE INHIBITOR AND PTERINDE AMINASE INHIBITOR

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ABSTRACT
A series of 4-phenyl-6 (substituted-phenyl)-[1,3,5]triazin-2-ylamine/-ol/-thiol[4(a-l)] derivatives have been synthesized by one pot multicomponent reaction between aromatic ester or acid, urea/guanidine hydrochloride/thiourea, and benzonitrile by exposing to microwaves at 40% microwave power (280 W). The accomplishment of the reaction was checked by TLC. Its structure was elucidated by ^{1}H–NMR and the ^{13}C-NMR spectra. In addition, biological prediction study of some [1,3,5]triazin-2-ylamine/-ol/-thiol[4(a-l)] derivative having good activity against Phosphodiesterase II inhibitor, Ubiquinol-cytochrome-c reductase inhibitor and Pterindeaminase inhibitor.

KEYWORDS
Onepot multicomponent reaction, microwave, TLC, ^{1}H–NMR and the ^{13}C-NMR spectra.

INTRODUCTION
Triazines are six-membered heterocyclic compounds with three carbon and three nitrogen atoms. The three isomers namely, 1,2,3-triazine, 1,2,4-triazine, and 1,3,5-triazine. The 1,3,5-triazines are the primogenital and most widely studied of the isomeric forms[1-11]. Given that 1,3,5-triazine is a symmetrical molecule, compounds of this type are frequently referred as *s*-triazines. In 1895 Nef accidently synthesized 1,3,5-Triazine from hydrogen cyanide and etheral solution saturated with hydrogen chloride in ethanol. The consequential salt was treated with base and distilled to give 1,3,5-triazine.
The most commonly used triazine derivatives are cyanuric acid and melamine. Cyanuric acid has been originated to naturally occur in nature in soil humus[11]. Marketable applications of cyanuric acid embrace stabilizers of swimming pool disinfectants, industrial cleaners, household bleach, dishwasher detergents, and general sanitizers.

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EFFICACY OF SOME PLANT EXTRACTS ON SPORE GERMINATION OF *PHAKOPSORA PACHYRIHZI* SYDOW

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ABSTRACT

Traditionally plant extracts were applied for the control of diseases caused by microorganisms. Hence, the present investigation deals with aqueous plant extracts of ten plants which were screened for their fungitoxicity against *Phakopsora pachyrhizi.* Inhibition of spore germination and germ tube length of *Phakopsora pachyrhizi* was tested. Propiconazole 0.1% used as a standard check was found better retardants for spore germination and germ tube length. Extracts of *Nerium oleander L* and *Lantana camara* L at 1 to 12 hr incubation period were highly effective in reducing the spore germination and germ tube length. Among the treatments *Parthenium hysteropehorus* L leaf extract exhibited less inhibitory effect against *Phakopsora pachyrhizi.* All the leaf extracts of ten plants showed better inhibitory effect on spore germination and germ tube length over control (Distilled Water).

KEYWORDS: *Phakopsora pachyrhizi*, Plant extracts, Fungitoxicity, Propiconazole, Spore germination.

INTRODUCTION

Rust of soybean caused by *Phakopsora pachyrhizi* sydow is an important disease causing considerable loss in grain yield. Microbial diseases of plants reduce the yield or the survival capability resulting in death. To avoid the loss of crop plants, several chemical preparations were used to control the disease caused by microorganisms. Control of plant diseases by chemicals cause environmental pollution and it is hazardous both for plants and animals. In such a situation, several higher plants have shown success in plant disease control due to presence of typical alkaloids, polyphenols, aminoacids and other antifungal substances. (Ashrafuzzaman and Hossain 1992, Hossain and Ashrafuzzaman 1994). Patil in the year 1996 evaluated several fungicides against the soybean disease. He reported that Hexaconazole (Contaf) at 0.05 % (1 ml per liter of water), Propiconazole (Tilt) at 0.05 % and Triadimefon (Bayleton) at 0.05 % (1 gram per liter of water) were the most effective fungicides against the disease. The seed leachates