



Founder



Karmaveer Bhausaheb Hiray

Mahatma Gandhi Vidyamandir's

Loknete Vyankatrao Hiray Arts, Science & Commerce College

Affiliated to S.P.P. Uni., Pune Id. No. PU/NS/ASC/018 [1971]
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Criteria 3- Research, Innovations and Extension

3.4- Extension Activities

3.4.1 Extension activities are carried out in the neighbourhood community, sensitizing students to social issues, for their holistic development, and impact thereof during the last five years. (QIM)

LIST OF RESEARCH PAPERS PUBLISHED

ACADEMIC YEAR 2017-18

Sr. No.	Title of the Paper	Name of the Author	Subject	Name of the Journal	ISSN No.
1.	Antibacterial potential of silver nanoparticles synthesized using Madhuca longifolia flower extract as a green resource	Bapu Sonu Jagdale	Chemistry	Microbial Pathogenesis	0882-4010
2.	Zinc Oxide Nanoparticle Catalyzed Biginelli Reaction under Microwave Irradiation: An Expedient and Green Synthesis of Dihydropyrimidinones	Bapu Sonu Jagdale	Chemistry	Researchers World-Journal of Arts, Science & Commerce	2231-4172
3.	Facile Green Synthesis of ZnO Nanoparticles, their Characterization and Gas Sensing Performance	Bapu Sonu Jagdale	Chemistry	Researchers World-Journal of Arts, Science & Commerce	2231-4172
4.	Theoretical Study of Molecular structure, Vibrational Spectra of Ethyl 2-amino-4-methyl-1, 3-thiazole-5-carboxylate by DFT Calculations	Bapu Sonu Jagdale	Chemistry	Researchers World-Journal of Arts, Science & Commerce	2231-4172
5.	A Synthesis of Chalcones and Study of their Antimicrobial Activities	Bapu Sonu Jagdale	Chemistry	Researchers World-Journal of Arts, Science & Commerce	2231-4172

6.	Study of physico-chemical properties, detection and toxicity study of organic compounds from effluent of MIDC Thane and GIDC Ankleshwar industrial zone	Prof.Dr.K.H.Kapadnis	Chemistry	Applied Water Science(springer publication)	2190- 5495
7.	Fabrication and characterization of pure and modified Co3O4 nanocatalyst and their application for photo catalytic degradation of eosin blue dye: a comparative study	Prof.Dr.K.H.Kapadnis	Chemistry	Journal of Nanostructure in Chemistry (springer publication)	2193- 8865
8.	Synthesis, structural characterization of LaCrO3 nanostructures and it's gas sensing Application	Prof.Dr.K.H.Kapadnis	Chemistry	Journal of Emerging Technologies and Innovative Research	2349-5162
9.	Density and Viscosity Studies of Fructose Solutions in Water and in aqueous NaCl NaBr, KCl and KBr solution	Prof.Dr.K.H.Kapadnis	Chemistry	International multidisciplinary E-research journal	234-87143
10.	Methanol Gas sensing properties of Pervoskite LaFeO3 Nanoparticles doped by Transition Metals Cr ³⁺ and Co ²⁺	Prof.Dr.K.H.Kapadnis	Chemistry	Journal of chemical and pharmaceutical research	ISSN 975-7384
11.	Synthesis, Characterization and DFT Studies of 2-[(2-substitutedphenyl) carbamoyl] benzoic acids	Thansing Bhavsing Pawar	Chemistry	Journal of Chemical, Biological and Physical Sciences	2249-1929
12.	Exploration of catalytic performance of nano -La2O3 as an efficient catalyst for dihydropyrimidinone /thione synthesis and gas sensing	Thansing Bhavsing Pawar	chemistry	Journal of Nanostructure in Chemistry	ISSN: 2008-9244 (Print) 2193-8865 (Online)

13.	11. Design and synthesis of 1,4-substituted 1H-1,2,3-triazole-quinazoline-4(3H)-one by Huisgen 1,3-dipolar cycloaddition with P13Ky isoform selective activity	Dr. Chobe Santosh S.	Chemistry	Bioorganic and Medicinal Chemistry Letters	1464-3405
14.	Chemotherapeutic interest : Green Approach towards synthesis of fused 1,5-Benzothiazepine and their invitro antimicrobial screening	Dr. Chobe Santosh S.	chemistry	International Journal Of Chemical & Physical Sciences	2319-6602
15.	Ring closure metathesis:Green Approach towards Synthesis of Hydroxyflavone Derivatives and its Antifungal Screening	Dr. Chobe Santosh S.	chemistry	researchers world	2231-4172
16.	Polyethylene Glycol (PEG-400): As Green Reaction Media for Rapid Synthesis of Preparation of Isoxazoline derivatives and Its Antimicrobial Screening	Dr. Chobe Santosh S.	Chemistry	International Journal of Scientific Research in Science and Technology	2395-602X
17.	DFT Study on Vibrational Spectra and HOMO–LUMO of p-Chloro Benzohydrazide	Mr.S.L.Dhonnar	Chemistry	Researchers World-Journal of Arts, Science & Commerce	2231-4172
18.	“Synthesis and characterization of Schiff base derived from vanillin with various amine and formation of Co(II), Cu(II) and Ni(II) metal complexes with derived Schiff base.	Mrs.S.P.Jadhav	Chemistry	World Journal of Pharmaceutical Research	2277– 7105
19.	Synthesis and Characterization of Schiff bases of Benzaldehyde with Nitroanilines and their Cobalt, Nickel and Copper metal Complexes	Mrs.S.P.Jadhav	Chemistry	Reserchers world journal of arts science and commerce	ISSN 2231-4172

20.	A census of Tanniniferous and Gum-Yielding Plants In Khandesh Region	Dr. S B Shisode.	Botany.	ResearchersWorld (Journal Of Arts, Science & Commerce)	2231-4122
21.	Applications of Tarig Transformation to new fractional derivatives with Non singular kernel	S. D. Manjarekar,A. P. Bhadane	Mathematics	Journal of Fractional Calculus and Applications	2090 - 5858
22.	Applications of New conformable fractional Elzaki Derivative	S. D. Manjarekar,A. P. Bhadane	Mathematics	International Journal of Research and Analytical Reviews (IJRAR)	E-ISSN 2348-1269,
23.	Generalized Elzaki – Tarig transformation and its applications to new fractional derivative with Non singular Kernel	S. D. Manjarekar,A. P. Bhadane	Mathematics	Progress in Fractional Differentiation and Applications (PFDA)	2356 – 9336
24.	Effect of heavy metals on antioxidant biomarker enzymes and biochemical constituents in different tissues of <i>Lamelleidensmarginallis</i> in different reservoirs of Nasik District.	Resham Bhalla	Zoology	Nature, Environment and Pollution Technology.	ISSN 2395-3454
25.	Toxic effect of heavy metals on DNA, RNA and ascorbic acid content in soft tissues of the fresh water bivalve <i>Lamellidenscorrianus</i> from different reservoirs of Nashik district (M.S.)"Vol.7 (5): 2101-2105.	Resham Bhalla	Zoology	International Journal of Current Research in Life Sciences.	2319-9490
26.	Toxicant stress on protein and ascorbic acid contents in different tissues of freshwater bivalve <i>Parreysia cylindrica</i> from different reservoirs of Nashik district. Vol. 24 (2): 284-288.	Resham Bhalla	Zoology	Ecology, Environment and Conservation is in Master Journal List of	0971-765X

				ISI (Thomson Reuters, U.S.A.).	
27.	Effect of heavy metals on enzyme activity in the digestive glands of freshwater bivalve, <i>Parreysia cylindrica</i> from different reservoirs of Nashik district.	Resham Bhalla	Zoology	Asian Journal of Microbiology Biotechnology and Environment Science.	0972-3005
28.	Protein, ascorbic acid and antioxidative enzymes alterations in the digestive gland of <i>Lamellidenscorrianus</i> due to heavy metals from different reservoirs of Nashik district. (M.S.) Vol. 5 (1): 30-37	Resham Bhalla	Zoology	International Journal of Scientific Research in Science and Technology (IJSRST).	2395-6011
29.	Effect of L-ascorbic acid on Lambda cyalothrin induced alterations in the lipid contents in different tissues of the freshwater bivalve, <i>Lamellidensmarginalis</i> (Lamarck) Vol-IX, Special Issue, PP 186-189.	Resham Bhalla	Zoology	International Referred Research Journal: RESEARCHERS WORLD, Journal of Arts, Science and Commerce.	2231-4172.
30.	DETERMINATION OF HEAVY METALS (ARSENIC, CADMIUM AND LEAD) FROM DIFFERENT BODY LOTIONS	Dr. Anita P. Patil	Zoology	World Journal of Pharmaceutical Research,	2320-2882
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32.	Phytoplankton diversity observed in Gangapur dam at Nashik district Maharashtra	Dr. Rekha Bhadane	Zoology	Researchers world journal of Arts, Science & commerce	2231-4172
33.	Influence of Firing Temperature on Nature of Screen Printed WO ₃ Thick Films	Prin. Dr. C. G. Dighavkar	Electronics delete	Researchers World, Vol.IX	ISSN:2231-4172
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40.	Sensing behavior of Screen printed nanocrystalline copper oxide thick films in presence of H ₂ S atmosphere	Dr. Arun Vittal Patil	Electronics	Researcher World	ISSN – 2231-4172
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49.	The photoconductivity of Ag-Te thin films as a function of thickness and composition at room temperature.	Dr. Ugalal Pandit Shinde	Electronics	International Journal of Chemical and Physical Sciences	ISSN 2319-6602
50.	Thickness Dependent Thermoelectric Power (α) of Ag-Te Thin Films	Dr. Ugalal Pandit Shinde	Electronics	Pelagia Research Library Advances in Applied Science Research	ISSN : 0976-8610
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52.	Composition dependent thermoelectric Power (α) of Ag-Te thin films as a function of temperature and thickness.	Dr. Ugalal Pandit Shinde	Electronics	International Journal of Engineering Science Invention	ISSN (Online): 2319 – 6734

53.	Effect of potassium iodide on solubility and density of Copper iodide in water and DMF at various temperatures.	Dr. Ugalal Pandit Shinde	Electronics	Research Journal of Science Engineering and Technology	ISSN 2454-3195
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55.	Composition Dependent Thermoelectric Power (α) of Zn-Te Thin Films as a Function of Temperature and Thickness	Dr. Ugalal Pandit Shinde	Electronics	International Journal of Emerging Technology and Advanced Engineering	ISSN 2250-2459
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59.	"Measurement Studies: Mixing Properties of Binary Liquid Mixtures of Ester with Alkanols at Various Temperature".	K. B. Bhamare	Physics	Researchers World, Vol- IX, special Issue, (2018) pp 95-97	2231-4172
60.	"Influence of Firing Temperature on Nature of Screen Printed WO ₃ Thick Films"	K. B. Bhamare, R. Y. Borse, A. V. Patil, C. G. Dighavkar	Physics	Researchers World, Vol. 9 (2018) pp 1-4	2231-4172
61.	"NO ₂ Gas Sensing Properties of Screen Printed WO ₃ Thick Films"	K. B. Bhamare, R. Y. Borse, A. V. Patil, C. G. Dighavkar	Physics	International Journal of Chemical and Physical Sciences- IJCPS Vol. 7 (2018), pp 375-381	2319-6602
62.	"Synthesis and Ammonia gas sensing study of Al doped WO ₃ nanoparticles	Kaveri B Bhamare	Physics	International Journal of Research and Analytical Reviews (IJRAR.ORG) Vol.5, Issue 3, August 2018 pp.225-235,	E-ISSN 2348-1269, P-ISSN 2349-5138
63.	"Indoor Power Generation by Vaseline Glass Plate Doped with Non-Fermi Liquid behaviour of Electron Metals (U _x Th _{1-x} PdSi ₂ , x ≤ 0.07)".	K. B. Bhamare, R. V. Suryawanshi	Physics	International Journal of Creative Research Thoughts (IJCRT), Vol.5, Issue ,1 March 2017 pp.871-873	2320-2882
64.	"Preparation and Characterizations of Bi-Doped Tin Oxide Thin Film Gas Sensor' Researcher's World"	S. J. Patil	Physics	Researchers World	ISSN-2231-4172,

65.	The young's modulus of Cu, Al, Fe, Stainless steel and Wood by using Y by bending of a bar technique.	S. J. Patil	Physics	Journal of Ultra-Scientist of Physical Sciences Section B	ISSN- 2319-8052 (Online)
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67.	"Effect of Bi doping on Electrical and Gas Sensing Properties of Tin Oxide Thin Film Gas Sensor Prepared by Physical Vapour Deposition Method"	S. J. Patil,	Physics	Journal of Research & Development	(ISSN-2230-9578)
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80.	Effects of yoga on level of Depression among females suffering from Polycystic Ovarian Syndrome (PCOD)	J.A.Sode	Psychology	International Journal on Arts, Management and Humanities	ISSN - 23195231
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Antibacterial potential of silver nanoparticles synthesized using *Madhuca longifolia* flower extract as a green resource

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<https://doi.org/10.1016/j.micpath.2018.05.040> 

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Abstract

The green and one-step synthesis of silver nanoparticles (AgNPs) has been proposed as simple and ecofriendly. In the present study, a flower extract of *Madhuca longifolia* was used for the reduction of silver nitrate into AgNPs, with phytochemicals from the flower extract as a reducing and stabilizing agents. The synthesized AgNPs were spherical and oval shaped and about 30–50 nm sizes. The appearance of a brown color in the reaction mixture is a primary indication of AgNPs formation, and it was confirmed by observing UV-visible spectroscopy peak at 436 nm. The Energy Dispersive X-ray spectra and X-ray diffraction analysis results together confirm that the synthesized nanoparticles contain silver and silver chloride nanoparticles. The Zeta potential analysis indicates presence of negative charges on synthesized AgNPs. The FT-IR study represents involvement of functional groups in AgNPs synthesis. Synthesized AgNPs shows potential antibacterial activity against Gram-positive and Gram-negative pathogens. *M. longifolia* flower is a good source for AgNPs synthesis and synthesized AgNPs are applicable as antibacterial agent in therapeutics.

Introduction

Nowadays, green synthesis of metal nanoparticles is the center of attraction for interdisciplinary researchers. The biological method for nanoparticles synthesis is more convenient than conventional methods such as physical and chemical methods which utilize of high energy, pressure and toxic chemicals [[1], [2], [3]]. The biological method for silver nanoparticles (AgNPs) synthesis includes the use of bacteria [4], fungi [5], and actinomycetes [6], algae [7] and plant extracts [1,2]; among them, the use of plant extract is more sophisticated. Micro-organisms need additional efforts such as isolation, identification, growing in special media and maintain at specified temperature, but the extraction of plant extract is simple and easy to store and no more chances of contamination which is more frequent in case of bacteria [1,4]. The nanoparticles synthesized using chemical methods may not be useful in biomedical applications due to their toxic nature [8]. The green synthesized nanoparticles have been reported for list of biomedical

Zinc Oxide Nanoparticle Catalyzed Biginelli Reaction under Microwave Irradiation: An Expedient and Green Synthesis of Dihydropyrimidinones

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ABSTRACT

In the present work, we report Green, inexpensive and simple procedure for the synthesis of dihydropyrimidinones by utilizing zinc oxide nanoparticles (ZnO NPs). The ZnO NPs were synthesized by greener method and were characterized by FTIR, XRD, and SEM. We used these nanoparticles for the one pot synthesis of dihydropyrimidinone derivatives.

Keywords: Biginelli reaction, Dihydropyrimidinone, zinc oxide nanoparticles, one pot multi-component reaction (MCR), microwave synthesis.

INTRODUCTION:

Presently days green chemistry [1-6] is pulling in numerous scientists and it is the need of society. Microwave [7, 8] routines reduces time and turning out to be most imperative for quick research. Dihydropyrimidinones [9-12] are essential class of organic chemistry science which assumes vital part in restorative science. These compounds go about as antibacterial, antifungal, subterranean insect hypertension specialists furthermore go about as inhibitor for malarial parasites etc. One very important MCR that produces an interesting class of nitrogen heterocycles is the Biginelli dihydropyrimidinone synthesis. In 1893, Italian chemist Pietro Biginelli reported the acid catalyzed cyclocondensation reaction of ethyl acetoacetate, benzaldehyde, and urea. The reaction was carried out by simply heating a mixture of the three components dissolved in ethanol with a catalytic amount of HCl at reflux temperature. The product of this novel one-pot, three-component synthesis that precipitated on cooling of the reaction mixture was identified correctly by Pietro Biginelli as 3,4-dihydropyrimidin-2 (1H)-one (DHPMs). It is visually perceived the foregoing discussion that there are many catalytic methods available in literature for the synthesis of dihydropyrimidinones. However most of the methods reported use expensive catalysts, vigorous acidic conditions, and higher temperature and requires longer reaction time. Some of methods resulted in unsatisfactory yields and involved some product, isolation procedures. Consequently, we thought, there is a scope for further innovation towards milder reaction conditions, cheaper and efficient catalyst, shorter reactions time and better yield. Green chemistry is the need of society and therefore finds important roles in organic synthesis. The disadvantage of performing homogeneously catalyzed reactions is the difficulty of separating the catalyst from the product and reusing the expensive catalyst. Heterogeneous organic reactions have proven useful to chemists in the laboratory as well as in the industrial context. These reactions are effected by the reagents immobilized on the porous solid supports and have advantages over the conventional solution phase reactions because of the good dispersion of active reagent sites, associated selectivity and easier work-up. The recyclability of some of these solid supports renders these processes into truly eco-friendly green protocols. Our study is mainly concentrated on to develop an incipient and more environmentally benign protocol for Biginelli reaction as well as to synthesize the biologically active compounds utilizing ZnO particles [13-18] under microwave irradiation.

Facile Green Synthesis of ZnO Nanoparticles, their Characterization and Gas Sensing Performance

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ABSTRACT

In this research work, we report eco-friendly strategy for the synthesis of nanostructured zinc oxide particles. These nanoparticles are stable and prepared from zinc nitrate hexahydrate by using Coriandrum sativum leaf extract. The particle size (51nm) of synthesized zinc oxide nanoparticles is measured from XRD pattern of ZnO nanoparticles. These particles were used as gas sensors for ammonia and hydrogen sulphide gases and this sensor was found to be highly sensitive for both gases.

Keywords: Zinc oxide nanoparticles, XRD, Gas sensing, Coriandrum sativum.

INTRODUCTION:

Nano crystalline (NC) materials, exhibiting small particle size and large surface area, can be used for gas which require an excellent surface effect. The demand for accurate and precise results are very important to monitor and control environmental pollution. This have accelerated the development of new sensing materials over the last decade [1]. Zinc oxide (ZnO) is a unique material that exhibits semiconducting, optical, piezoelectric and pyroelectric properties. ZnO has the same crystal structure as GaN and a very close optical band gap of $E_g = 3.37$ eV, however, it has larger excitation binding energy (59 meV) at room temperature than GaN (28 meV) resulting in efficient excitonic optical devices. ZnO thin films have also been used as gas sensors [2] and optical waveguide devices. ZnO can be prepared by numerous methods, such as sol-gel, spray pyrolysis, sputtering, precipitation etc. [3–5]. Although a large number of gas detecting systems have currently been used in process control and laboratory analytics [6–9], high performance gas sensors with high sensitivity, high selectivity and rapid response speed are also needed to improve the levels of gas detection.

MATERIALS AND METHODS:

All the chemicals were purchased from Merck Company and were used directly without any further purification.

Synthesis of ZnO nanoparticles by green method:

0.02moles of Zinc nitrate hexahydrate was added into 50 ml distilled water with constant stirring on magnetic stirrer followed by addition of aqueous leaf extract of coriandum into same solution in the following specific sets 0.25, 0.5, 1, 1.5, 2, 3, 4, 5 ml with constant stirring. After this, 2M solution of NaOH was added to make the reaction mixture alkaline ($pH = 12$). This results in the formation of pale white aqueous solution which was stirred for nearly three hours on magnetic stirrer. Pale white precipitate was then taken out and washed with distilled water and after that by with methanol to get the precipitate free from impurities. The precipitate is then dried at room temperature for fourteen hours and after that dried on hot plate for $60-70^\circ C$ for five hours giving pale white coloured nanoparticles of ZnO.

Theoretical Study of Molecular structure, Vibrational Spectra of Ethyl 2-amino-4-methyl-1, 3-thiazole-5-carboxylate by DFT Calculations

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ABSTRACT

Molecular Structure and IR spectra data of Ethyl 2-amino-4-methyl-1, 3-thiazole-5-carboxylate have been determined by performing DFT molecular orbital calculations at B3LYP/6-311++G (d, p) theory level. The geometry parameters, total energies, HOMO-LUMO orbital energies, dipole moment, charges on the atoms and thermodynamic properties like entropy, heat capacity and enthalpy were calculated by using same method. Vibrational frequencies were compared with the experimental ones and discussed.

Keywords: DFT, FT-IR, Homo-Lumo, Thiazole.

INTRODUCTION:

Thiazole is one of the important members of five membered aromatic heterocyclic ring compounds. Commercially important thiazoles include dyes [1], fungicides [2], accelerators in rubber vulcanization and antioxidants. Wide varieties of applications of 2-amino thiazoles have been used in the fields of pharmaceuticals, agriculture, photography and related activities. 2-Amino Thiazole derivatives are found to possess antiviral [3], antimicrobial [4], antifungal [5] anti-tubercular [6], anti-HIV [7], anti-inflammatory [8], anti-oxidative [9], fungicidal [10] activities. Dhonnar S.L. *et al* [11] reported the DFT study of azo pyrazole compound. The main objective of this paper is to synthesize the title compound by previously published method, investigate vibrational spectra and study their molecular structure, geometrical properties by using DFT/B3LYP/6-311++G (d,p) method.

EXPERIMENTAL DETAILS:

All chemicals required for synthesis were obtained from commercial grade (AR grade with purity >99%) and used without further purification. The title compound was synthesized by using published method [12] and structure confirmed by IR and ¹H NMR spectroscopy. Melting points of the synthesized compounds have been measured in open glass capillaries and were uncorrected. Infrared spectra were recorded on a Shimadzu FT-IR Spectrophotometer. ¹H NMR spectra recorded on a Bruker AM-500 spectrometer with tetramethyl silane as an internal standard.

Computational details:

The DFT calculations were performed on an intel core i7 personal computer using Gaussian-03 program [13]. Geometry of the title compound was optimized by DFT/B3LYP++G(d,p) basic set. Optimized structural parameters were used in the vibrational frequency calculations at DFT level to confirm the structure as minima. Vibrational band assignments were made using the Gauss View 4.1.2 molecular visualization program [14].

[Article](#)

A Synthesis of Chalcones and Study of their Antimicrobial Activities

February 2018 · [Researchers World – Journal of Arts Science & Commerce](#) 9(Special Issue)

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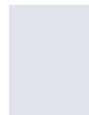
Abstract

The term Chalcones is used to describe compounds with the 1, 3-diphenylprop-2-en-1-one framework. Chalcones are natural substances found in a number of plants or synthetically prepared. These compounds have special interest due to their use as starting material, intermediates in the biosynthesis of flavonoids and in the synthesis of number of biologically active heterocyclic compounds. Some of these chalcones exhibit anti-cancer properties, cytotoxicity, anti-inflammatory, analgesic and also antipyretic properties. Many chalcones are potential antibacterial, antifungal and anti-ulcer agents. Besides biological activity certain chalcones have ability to block voltage-dependent potassium channels. Introduction of various substituted heterocyclic nucleus instead of aryl ring is also a subject of interest because it leads to SAR conclusion which helps us to synthesize pharmacologically active chalcones. This finding explains the significant interest of chemists, biochemists, and pharmacist in this particular group of compounds. In this article we synthesized the some chloro and nitro substituted chalcones and characterized them by using spectroscopic methods then products are screened for their antimicrobial properties. Most of the tested compounds exhibited significant antimicrobial activities.

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[Request full-text PDF](#)[Citations \(0\)](#)[References \(12\)](#)**Synthesis of novel amino acids, l-bis-tetrahydrofuranylglycines**[Article](#)

[Home](#) > [Applied Water Science](#) > [Article](#)[Download PDF](#)[Original Article](#) | [Open Access](#) | [Published: 10 October 2018](#)

Study of physico-chemical properties, detection and toxicity study of organic compounds from effluent of MIDC Thane and GIDC Ankleshwar industrial zone

[Prashant Bhimrao Koli](#) , [Kailas Haribhau Kapadnis](#) & [Uday Gangadhar Deshpande](#)[Applied Water Science](#) **8**, Article number: 196 (2018)**2002** Accesses | **15** Citations | [Metrics](#)

Abstract

The anthropological activities and huge industrialization to fulfil needs of mankind are

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Title Fabrication and characterization of pure and modified Co3O4 nanocatalyst and their application for photocatalytic degradation of eosine blue dye: a comparative study

Author(s) Koli Prashant Bhimrao | Kapadnis Kailas Haribhau | Deshpande Uday Gangadhar | PATIL MANOHAR RAJENDRA

Keywords Modified cobalt oxide nanoparticles Eosine blue Photocatalytic degradation
XRD EDS SEM TEM

Abstract The present work deals with the synthesis of cobalt oxide, and Fe²⁺-and Ni²⁺-doped cobalt oxide nanoparticles as a catalyst. The study is investigating the different factors in obtaining cobalt oxide, and Fe²⁺-and Ni²⁺-doped cobalt oxide nanoparticles. Photocatalytic degradation studies are carried out for water-soluble Eosine blue (EB) dye using cobalt oxide, and Fe²⁺-and Ni²⁺-doped cobalt oxide nanoparticles in aqueous solution. Different parameters such as initial dye concentration, dose of catalyst, contact time and pH have been studied to optimize reaction conditions. It is observed that Photocatalytic degradation is a more effective and faster mode of removing EB dye by cobalt oxide, and Fe²⁺-and Ni²⁺-doped cobalt oxide nanoparticles than work done before. The optimum conditions for the removal of the EB dye are initial concentration 40 mg/L, photocatalyst dose 0.8 g/L, and pH 7.5. The EDS technique gives the elemental composition of synthesised cobalt oxide, and Fe²⁺-and Ni²⁺-doped cobalt oxide nanoparticles. The TEM and XRD studies are carried for morphological feature characteristics of synthesized cobalt oxide, and Fe²⁺-and Ni²⁺-doped cobalt oxide nanoparticles. Pseudo-first-order kinetic has been investigated for both pure and doped cobalt oxide catalysts. Almost 95% dye degradation has been observed for doped cobalt oxide nanoparticles.



Cites

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References

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Koli, Prashant Bhimrao, Kapadnis, Kailas Haribhau, Deshpande, Uday Gangadhar, & PATIL, MANOHAR RAJENDRA. (2018). Fabrication and characterization of pure and modified Co₃O₄ nanocatalyst and their application for photocatalytic degradation of eosine blue dye: a



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Volume 5 Issue 12
December-2018
eISSN: 2349-5162

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Title

SYNTHESIS,STRUCTURAL CHARACTERIZATION OF LACRO3 NANOSTRUCTURE AND IT'S GAS SENSING APPLICATION

Authors

Vrushali S.Shinde
Chatur P. Sawant
Kailas H. Kapadnis

Abstract

: In display work we choose Sol-gel route for synthesis of LaCrO3 nanomaterial which found to act as a H2S gas sensor. Characterization of it was done by XRD, SEM, TEM, EDX etc. From XRD we got a nanomaterial having average crystallite size 13.01nm having JCPDS Card No. 33-0701 from which LaCrO3 is having a perovskite type orthorhombic material. The SEM spectrum shows particles which dispersed on surface and the EDX indicates the elemental composition. By TEM we confirmed its particle size is 39.48nm. The bands 596 cm⁻¹ for La-O stretch and 416.04 cm⁻¹ for Cr-O stretch showed by FTIR studies. From this material thick film were prepared by simple screen printing technique. Then the films were calcinated and were exposed to various gases at different temperature. The LaCrO3 sensor shows selectivity for H2S gas at working temperature range from 1500C to 2500C. Its response and recovery time were also studied.

Key Words

Sol-gel Method, LaCrO3 nanostructure, XRD, SEM, EDS, TEM, IR, H2S sensing.

Cite This Article

"SYNTHESIS,STRUCTURAL CHARACTERIZATION OF LACRO3 NANOSTRUCTURE AND IT'S GAS SENSING APPLICATION", International Journal of Emerging Technologies and Innovative Research (www.jetir.org), ISSN:2349-5162, Vol.5, Issue 12, page no.546-556, December-2018, Available : <http://www.jetir.org/papers/JETIR1812B70.pdf>

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Density and Viscosity Studies of Fructose Solutions in Water and in aqueous NaCl NaBr, KCl and KBr solutions"

March 2013

Authors:



Kailas Kapadnis

Research center in chemistry M.G.Vidyamandir's L.V.H.College Nasik

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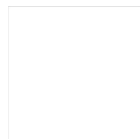


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Abstract and Figures

The volumetric and viscometric studies of glucose, fructose, sucrose and maltose have been determined in 0.05 M and 0.5 M KCl solutions at 298.15, 303.15, 308.15 and 313.15 K. The apparent molar volume (ϕ_v) values vary linearly with square root of concentration of KCl solution. The limiting apparent molar volume (ϕ_0^v) has been interpreted in terms of solute-solvent interaction. The ϕ_0^v values vary with temperature and can be represented in the power series of structure making and breaking capacity of electrolyte is inferred from the sign of dB/dT values. The apparent molar expansibility has also been determined. Glucose, fructose, sucrose and maltose have been found to be structure maker and breaker in aqueous KCl from molar volume as well as viscosity studies (PDF) Density and Viscosity Studies of Fructose Solutions in Water and in aqueous NaCl NaBr, KCl and KBr solutions".



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Research Article

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Methanol Gas Sensing Properties of Pervoskite LaFeO_3 Nanoparticles Doped by Transition Metals Cr^{3+} and Co^{2+}

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ABSTRACT

Nanomaterials found to be potent catalyst for various applications in today's era. The subtle Nanomaterials are the promising material in the field of catalysis. The nanomaterials are premonitory but their existence came into light with astonishing catalytic properties. The present research explains the synthesis of LaFeO_3 doped by transition metals such as Cr^{3+} and Co^{2+} . These Nanomaterials are prepared by Sol-gel method followed by preparation of thick films and subsequent gas sensing by methanol. The nanoparticles were characterized by XRD, SEM, EDS and IR. XRD study reveals that the average particle size calculated by Scherrer formula is 15.35 nm. The morphological properties and surface of nanomaterials can be imaged by SEM. The SEM investigation shows surface texture, colour and porosity of LaFeO_3 . It has homogeneous surface, microspores and mesopores as seen from its surface micrographs. EDS shows the elemental composition of every element in doped Pervoskite LaFeO_3 . The IR characterization shows the typical metal oxygen linkages for prepared nanomaterial. The characterized nanomaterials were subjected for investigation of methanol gas sensing properties by preparing thick films of doped LaFeO_3 .

Keywords: LaFeO_3 ; Gas sensing; Methanol; XRD; SEM; EDS; IR

INTRODUCTION

The use of nanomaterials in the ceramic fields is at the pre-eminence because of its great use in the field of research. The present study reveals fundamental property of nanomaterials like quick electronic response given by these tiny particles, in the form of catalyst. This special property has a great advantage in gas sensing properties. The Pervoskite material is the special class of materials studied because of their catalytic propensity. The lanthanum ferrate is an antiferromagnetic oxide with characteristic research properties, because the magnetic domains of LaFeO_3 found to be large enough for magnetic and electrical properties. The LaFeO_3 is found to be having orthorhombic structure. The typical oxide shows p-type semiconduction, the oxide shows highly non stoichiometric ratio, despite of these oxide are greatly used in most of the technological application such as sensors devices, detection of humidity i.e. Humidity sensors, alcohol detection, oxygen detection, carbon monoxide, and nitric oxide detection etc. There are various methods proposed for constructive synthesis of nanomaterials like mechanical method such as high energy ball milling and melt mixing, method based on evaporation, such as physical vapour deposition, laser vaporisation, (ablation) ionised cluster beam deposition, laser pyrolysis, sputter deposition such as magnetron sputtering, ECR plasma deposition, electric arc deposition, molecular beam epitaxy (MBE), chemical vapour deposition, synthesis of nanoparticles by colloidal route, Langmuir-Blodgett method, hydrothermal synthesis, sonochemical synthesis, microwave synthesis, sol-gel synthesis, even though biological synthesis of nanomaterials is also possible, such synthesis using microorganism, nanomaterial synthesis using plant extract, synthesis using DNA etc. [1- Sulbha Kulkarni]

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Research Article

Synthesis, Characterization and DFT Studies of 2-[(2-substitutedphenyl) carbamoyl] benzoic acids

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Received: 20 November 2016; **Revised:** 16 December 2016; **Accepted:** 22 December 2016

Abstract: 2-[(2-substitutedphenyl) carbamoyl] benzoic acids are synthesized by using phthalic anhydride with o-aminophenol, o-anisidine and o-chloroaniline. The synthesized compounds were characterized by spectral analysis. For the synthesized compounds the density functional theory at the B3LYP levels was performed using Gaussian 03(W). The frontier molecular energies, electronic chemical potential, chemical hardness, chemical softness and global electrophilicity indices have been calculated at DFT/B3LYP/6-31G (d,p) level of theory. In our present study the theoretical FT-IR spectra and GIAO/SCF ¹H NMR calculations of the title molecules were carried out and compared with the experimental data.


Keywords: Carbamoylbenzoic acid, DFT, HOMO, LUMO.

INTRODUCTION

The carbonyl group is a part of several biologically important molecules such as proteins, lipids and hormones. This group can interact with basic group like –OH/NH₂ to form a complex and influence the properties of such compounds¹. Intramolecular and intermolecular hydrogen bonding have been found to

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Exploration of catalytic performance of nano-La₂O₃ as an efficient catalyst for dihydropyrimidinone/thione synthesis and gas sensing

[Vishnu Ashok Adole](#) , [Thansing Bhavsing Pawar](#), [Prashant Bhimrao Koli](#) & [Bapu Sonu Jagdale](#)[Journal of Nanostructure in Chemistry](#) **9**, 61–76 (2019)**2555** Accesses | **43** Citations | [Metrics](#)

Abstract

In the present work, we report an proficient, elegant, and rapid one-pot synthesis of variety of 3,4-

dihydropyrimidinone (GID) and thione derivatives



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Design and synthesis of 1,4-substituted 1H-1,2,3-triazolo-quinazolin-4(3H)-ones by Huisgen 1,3-dipolar cycloaddition with PI3K γ isoform selective activity

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Abstract

A strategy for construction of medicinally important 1,4-substituted 1H-1,2,3-triazolo-quinazolin-4(3H)-ones has been devised and presented here. The compounds have been synthesized using one-pot multicomponent strategy under microwave assisted conditions. Triazolyl-quinazolinone based D-ring modified analogs are designed based on IC87114 scaffold, which is first known isoform selective inhibitor of PI3K δ . Herein, we identified two triazolyl-quinazolinone compounds (**5a** and **5l**) based on same scaffold with PI3K γ specific inhibitory potential, the selectivity towards this isoform is well supported by in silico results, wherein, these compounds show better interaction and affinity and inhibitory activity for PI3K γ rather than PI3K δ . This repositioning of scaffold from PI3K δ to PI3K γ isoform can be very useful from medicinal chemistry and drug discovery perspective to unravel molecular interactions of this new scaffold in different cellular pathways.

Graphical abstract

Chemotherapeutic Interest: Green Approach towards Synthesis of fused 1,5 - Benzothiazepine and their *invitro* antimicrobial Screening

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ABSTRACT:

A simple and convenient route is described the reaction of o-aminothiophenol and its derivative as precursor for synthesis of polyfunctionalised 1,5-benzothiazepine derivatives as pharmacological and medicinal interest. 1,5-benzothiazepine and its derivative prepare cyclocondensation reaction with carbonyl functionalities, takes place by nucleophilic addition followed by cyclisation using recyclable poly (ethylene glycol-400) as an alternative reaction solvent. The reaction is clean with excellent yield, shorter reaction time and reduces the use of volatile organic compounds (VOCs). The chemical structure of the newly synthesized compounds was confirmed by IR, ¹HNMR and Mass spectral data. Furthermore, all the synthesized compounds were evaluated for their antimicrobial screening against several pathogenic representatives. Synthesis of such 1,5-benzothiazepine derivatives and their potential to develop better chemotherapeutic agents.

KEYWORDS:

Cyclocondensation, O-aminothiophenol, Chalcone, Polyethylene glycol (PEG-400), Green Reaction.

INTRODUCTION

Chemical properties of 1,5-benzothiazepine derivatives have been reviewed in the last few years. However, the usefulness of 1,5-benzothiazepine as a privileged system in medicinal chemistry has prompted the advances on the chemotherapeutic potential of this system. The preparative methods include ring closure reaction, aromatization and ring transformation^{1,2}, Biological properties^{3,4}, medicinal chemistry⁵, 1,5-benzothiazepine derivatives have been privileged scaffolds in drug discovery. The 1, 5-benzothiazepine class of compounds are important as calcium channel blockers with proven utility such as diltiazem and those in which the fused benzene ring is substituted at various positions have been found to have enhanced pharmacological properties⁶. The presence of benzothiazepine scaffolds in natural product and pharmaceutical determines their potential use as antipsychotic agents⁷. The 1, 5-benzothiazepine derivatives has been reported as hypertensive agent's cletiazem⁸. 1, 5-benzothiazepine derivatives and evaluated for their antibacterial activities.⁹ various substitution on phenyl ring were also tried to give potent antibacterial compounds¹⁰. Several 4, 6-Bis (2'-substituted-2, 3-dihydro-1, 5-benzothiazepin-4-yl) resorcinol have been found to be potential antifeedants⁷, benzothiazepine as prospective cardiovascular agents¹¹ anticonvulsant and CNS depressant activity¹² Recently, liquid

Ring Closure Metathesis: Green Approach towards Synthesis of Hydroxyflavone Derivatives and its Antifungal Screening

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ABSTRACT

A simple and convenient route is described for the synthesis of hydroxyflavones by using recyclable poly (ethylene glycol-400) as an alternative green reaction solvent with hydrogen peroxide. The reaction is clean with excellent yield, shorter reaction time and reduces the use of volatile organic compounds (VOCs). Mycotic infections are treated by antifungal agents. These agents can be either fungistatic or fungicides. The incidence of systemic mycoses continues to rise steadily. This increase is due to impart to improve recognition and diagnosis of fungal infections, but also to the prolong survival of patient with defective immune system in their host defense mechanism including patience with neoplastic diseases, organ transplant recipients, diabetics and patients with HIV. These patients' populations are susceptible to an ever growing list of opportunistic fungi. The chemical structure of the newly synthesized compounds was confirmed by IR, ¹HNMR and Mass spectral data. Furthermore, all the synthesized compounds were evaluated for their antifungal screening against several pathogenic representatives.

Keywords: Polyethylene glycol (PEG-400), Hydroxyl flavone, H₂O₂, Antifungal Screening.

INTRODUCTION:

Flavones are the 2-Arylchromen-4-ones is an important class of flavonoids. The flavonoids are a very well-known family of natural products found almost exclusively in the plant kingdom; most of them are highly colored and as a consequence, They are found in seeds, citrus fruits, olive oil, tea and red wine¹ and play a vital role in the ecology of plants by making flowers and fruits attractive to bees and birds². The family member includes flavones, flavonols, chloroflavones, flavanones and isoflavones. Many naturally occurring and synthetic flavonoids are known to have significant biological activities.^{3, 4} Chromanones and flavones are integral part of human diet and have been reported to exhibit a wide range of biological effects.⁵ They also demonstrate, antitumor,⁷ antibacterial,⁶ antimalarial⁹ antimicrobial,⁸ and antihypertensive¹⁰ activities. Flavonoids have the same basic skeleton and the key feature which distinguishes one structural type from the other is the oxidation level of the various carbons in the heterocyclic ring. They possess a unique importance as about 300 different compounds of this class have so far been isolated from natural sources and thousands of their derivatives have been synthesized.

**SYNTHESIS AND CHARACTERIZATION OF SCHIFF BASE
DERIVED FROM VANILLIN WITH VARIOUS AMINE AND
FORMATION OF Co(II), Cu(II) and Ni(II) METAL COMPLEXES WITH
DERIVED SCHIFF BASE.**

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Article Received on
21 August 2017,

Revised on 10 Sept. 2017,
Accepted on 30 Sept. 2017

DOI: 10.20959/wjpr201712-9797

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ABSTRACT

The Schiff base ligand synthesized from the Condensation of vanillin with primary amines. These Schiff base were used to prepare metal complexes of Co(II), Cu(II) & Ni(II). All synthesized compound were characterized by TLC, M.P., Solubility, Spectroscopic techniques show that Schiff base behave as a bidentet Ligand and metal complexes purposed to octahedral geometry where metal to ligand ratio is (1:2). The synthesized ligand and metal complexes are screened for antibacterial activity against E-coli, B-Subtilus, Pseudomonas and antifungal activity against Aspergillus niger.

KEYWORDS: Vanillin, Amine, Synthesis, Characterization, metal complex etc.

INTRODUCTION

The Schiff base and their metal complexes have special important in the field of co-ordination chemistry. Schiff base compound ($-\text{CH}=\text{N}-$) are usually formed by the condensation of primary amines with chelating ligands having, N,S and O as a donor atoms are attracting attention due to their versatile nature of metal binding mode. Transition metal have a strong tendency to form Co-ordination complex due to small size high charge densities and vacant (n-1) d orbital. The synthesis and application of Schiff base and their Coordination compounds have been highly considered in inorganic and bio inorganic field similar to some

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Article

Polyethylene Glycol (PEG-400): As Green Reaction Media for Rapid Synthesis of Preparation of Isoxazolinederivatives and Its Antimicrobial Screening

December 2017

Authors:

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Abstract

We wish to describe an efficient and rapid synthesis of isoxazolines by the reaction of substituted pyrazol-5-one were condensed with hydroxylamine hydrochloride in presence of clay (pH= 12.5) and PEG-400 as a green reaction media. Herein, we report the conventional condensation method of substituted pyrazol-5-one with hydroxylamine hydrochloride in PEG-400 as reaction solvent at mild reaction condition. Structures of the synthesized compounds were confirmed by the spectral analysis. Furthermore, all the synthesized compounds were evaluated for their antimicrobial screening against several pathogenic representatives, these newly synthesized compounds were screened for their antimicrobial activity against bacterial strain *Escherichia coli* (MTCC-443), *Bacillus subtilis* (MTCC-441), *Staphylococcus aureus* (MTCC-96) and *Salmonella typhi* (MTCC-98). The antifungal activity was evaluated against *Aspergillus niger* (MTCC-1781), *Aspergillus flavus* (MTCC-3008), *Candida albicans* (MTCC-227) and *Penicillium chrysogenum* (MTCC-160). The result revealed that most of the compounds showed good to moderate Antimicrobial screening. The major advantages of this protocol are it gives excellent yields of products, work up procedure and isolation is easier, Procedure is green and environmentally benign, shorter reaction times.

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DFT Study on Vibrational Spectra and HOMO-LUMO of p-Chloro Benzohydrazide

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ABSTRACT

In this work, we synthesized p-Chloro benzohydrazide by reported method and confirm by spectroscopic techniques. The density functional theoretical (DFT) computations were performed at B3LYP method with the basis sets 6-311+G (d, p) to derive the optimized molecular geometry, bond length, bond angle, harmonic vibrational frequencies of p-Chloro benzohydrazide. The theoretically investigated vibrational frequencies of p-Chloro benzohydrazide compared with existing experimental results. The result shows a high correlation between the theoretical and experimental ones. In addition, the parameters depending on HOMO, LUMO such as electronic chemical potential, chemical softness, global electrophilicity index and global hardness are investigated with the same level of DFT.

Keywords: DFT, FT-IR, HOMO-LUMO, P-CHLORO Benzohydrazide.

INTRODUCTION:

Acid hydrazides are an important class of biologically active compounds exhibiting a variety of biological activities notably antifungal [1] anticancer [2] antitubercular [3] antimicrobial [4] insecticidal [5] Antiparasitic [6] activities. Some acid hydrazides were reported to be components of deodorant compositions that can be used for removal of offensive odor components [7]. In addition; Benzohydrazides are also used for the construction of heterocyclic rings due to the presence of carbonyl functionality as well as two nitrogens which can behave like nucleophiles in a number of reactions. Density functional theory has been very popular for theoretically calculating molecular properties like molecular structures, vibrational frequencies, ionization energies and reaction paths. Dhonnar S.L *et al* reported the DFT study of (E)-3, 5-dimethyl-1-phenyl-4-(p-tolyldiazenyl)-1H-pyrazole by using standard theory (B3LYP) /6-311++G (d, p) method and basis set [8]. Arun B.Sawant *et al* reported the Synthesis and DFT study of 6, 8-dichloro-2-(4-chlorophenyl)-4H-chromene-4-one [9]. The molecular structure parameters of the title compound have been calculated by density functional theory (B3LYP) with 6-311+G (d, p) basis set. The calculated vibrational frequencies have been analyzed and compared with obtained experimental FT-IR data.

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SYNTHESIS AND CHARACTERIZATION OF SCHIFF BASE DERIVED FROM VANILLIN WITH VARIOUS AMINE AND FORMATION OF Co(II), Cu(II) and Ni(II) METAL COMPLEXES WITH DERIVED SCHIFF BASE

October 2017 · [World Journal of Pharmaceutical Research](#) 6(12):8

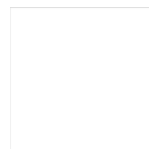
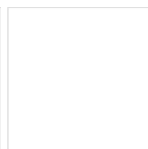
DOI:10.20959/wjpr201712-9797

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Abstract and Figures

ABSTRACT The Schiff base ligand synthesized from the Condensation of vanillin with primary amines. These Schiff base were used to prepare metal complexes of Co(II), Cu(II) & Ni(II). All synthesized compound were characterized by TLC, M.P., Solubility, Spectroscopic techniques show that Schiff base behave as a bidentate Ligand and metal complexes purposed to octahedral geometry where metal to ligand ratio is (1:2). The synthesized ligand and metal complexes are screened for antibacterial activity against E-coli, B-Subtilus, Pseudomonas and antifungal activity against Aspergillus niger.

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Synthesis and Characterization of Schiff bases of Benzaldehyde with Nitroanilines and their Cobalt, Nickel and Copper metal Complexes

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ABSTRACT

Schiff base and their metal complexes has been a subject of research for longer period of time and till date it is various researchers are aggressively focusing on synthesis of various Schiff base with different metal complexes and try to identify their unique properties. The condensation of benzaldehyde and meta nitro aniline in ethanol medium in presence of Acetic acid gives isolate schiff's bases. Such an attempt made here to identify the benzaldehyde and m-nitroaniline Schiff base and its three metal complex derivatives made up of Nickel, Copper and Cobalt. Synthesis was confirmed by IR ,NMR and antimicrobial activity was determined using E.Coli, Bacilus, pseudomonas and Aspergillus niger.

Keywords: Benzaldehyde, Schiff base, m-nitro aniline, metal complex, antimicrobial activity.

INTRODUCTION:

The literature reveals that the Schiff base ligands are excellent Co.Ordinating ligand it forms a stable complex with different transition metal ions. Schiff bases and their metal complexes have been used as anti-inflammatory, analgesic, anticancer, antiviral, fungicidal, pesticidal, bactericidal, insecticidal, herbicidal and growth regulating agents. They also found a place in the preparation of high temperature and automobile antiglare mirrors, organic semiconductors, filaments, deodorants, light stabilizers, dental materials, cross-linked polymers, corrosion inhibitors and perfumes. Other important fields where azomethines employed were catalysis, photography, paints and pigment. Many Schiff base complexes showed excellent catalytic activity in various reactions at high temperature (>100°C) and in the presence of moisture. Over the past few years, there have been many reports on their applications inhomogeneous and heterogeneous catalysis [1, 2]. In the past two decades, the synthesis, structure and properties of Schiff base complexes have stimulated much interest for their noteworthy contributions in single molecule-based magnetism, material science, catalysis of many reactions like carbonylation, hydroformylation, reduction, oxidation, epoxidation and hydrolysis, etc [3,4]. A great deal of work has been reported on the synthesis, structural investigations, various crystallographic features, mesogenic characteristics, structure-redox relationships and catalytic properties of different types of Schiff bases and their complexes with transition and non-transition element[5-8].

In this research project, I will try to search which Schiff base ligand gives the best yield by using benzaldehyde with 3-nitroaniline and formation of metal complexes to check their antimicrobial activity.

EXPERIMENTAL:

Water used in present investigation was redistilled in a glass distillation assembly. All solvents used for synthesis and characterization experiments were HPLC grade and AR grade. The Chemicals such as ethanol, Acetic acid, benzaldehyde were purchased from Sigma-Aldrich Ltd. and were used without purification. The metal salts were purchased from Sigma-Aldrich Ltd. The glassware's were used made of Borosill glass. An analytical balance of 100µg sensitivity was used for weighing samples.

A Census of Tanniniferous and Gum-Yielding Plants in Khandesh Region of Maharashtra

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ABSTRACT

The plant kingdom is a thesaurus of biodynamic constituents, and angiosperm have occupied most of man's attention in his search for useful products. Biodiversity is thus a key for progress of mankind. India has now prove that it has its own characteristic flora. The potentialities have been also fairly searched out. The present authors investigations from floristic and utilization point of view are published. Both investigations are now being re-assessed for phytoconstituents. The present paper projects the status of availability and potentiality of tannins and gum yielding taxa. The former are represented by total 22 and the latter by 27 angiospermic species in Khandesh region of Maharashtra. These are pertinently assessed in this communication.

Keywords: Tannin, Gum, Khandesh, Maharashtra.

INTRODUCTION:

Survey and documentation of the floristic wealth of a region is a prerequisite for planning the proper utilization of its potential plant resources. In other words, documentation of biodiversity, its conservation and sustainable utilization are the essential mantras of biodiversity. Biodiversity is thus a key for progress of mankind. The present author and his associates investigated floristic wealth and traditional utilities in Khandesh region of Maharashtra state (India) (Patil, 2003; Kshirsagar and Patil, 2008; Pawar and Patil, 2008)

The plant kingdom represents a rich storehouse of organic compounds. There are few indeed who would doubt that plant kingdom is a thesaurus of biodynamic constituents of academic interest and often of practical value to medicine and industry. Yet, perhaps, few experts in plant science fully realize the extent of this thesaurus. The plant kingdom includes a variety of plant groups. The present authors, however put emphasis on angiospermic plants. We are aware that angiosperms are the most abundant plants in all inhabited parts of the world. Man immediately pictures on 'angiosperm' when the word 'plants' is mentioned. It is, therefore, no strange that the present authors attended in their search for useful products. In this communication, the authors surveyed availability of *vis-à-vis* potentiality of phytoconstituents intensively present in the floral elements of Khandesh region. Khandesh region constitutes presently three districts viz., Jalgaon, Dhule and Nandurbar bordering northern part of the state of Maharashtra (India). The information is freely borrowed from literature (Nayaret al., 1989, 1994; 1948-1976; Watt, 1089-1893; Kochhar, 1981; Pandey, 2006; Patil, 2008). Tanniniferous and gum-yielding plants are focussed in this account. The information is provided in the Tables I & II with necessary details.

DISCUSSION:

India has no flora as a separate entity but is an admixture of the floras from adjacent countries. Sir J. D. Hooker was thus prompted to conclude based on floristic studies in Indian subcontinent before Indian independence. Now it is conveniently demonstrated that 'India' has a flora of its own. It has about 33% taxa endemic. Moreover, half of world's aquatic flowering plants flourish in India. This is the scenario after handworks of Indian botanists. We have national, regional, state floras, besides district floras. Thus floristic documentation is fair. It is also matter of proud that traditional and classic utilities in Indian region have been also put on record.

APPLICATIONS OF TARIG TRANSFORMATION TO NEW FRACTIONAL DERIVATIVES WITH NON SINGULAR KERNEL

SHRINATH MANJAREKAR, A. P. BHADANE

ABSTRACT. In this paper, we have obtained the relation between the new fractional derivatives by using Tarig Transformation along with this as an application; we have solved fractional order partial differential equation by using this new definition.

1. INTRODUCTION

The word Transform tells us about shifting the problem into another domain which is simple to calculate rather than the previous domain and after solving it again coming back to the given situation by Inverse Transform . There are different kinds of Transformations having different kernels like Laplace, Fourier, Mellin, Hartley, Yang Fourier and many more to solve the real life problems([6], [8]) mainly in signal processing, computational fluid dynamics, fractals, Bio mathematics and in fractional calculus [6].The fractional calculus has long back history of over centuries but the tremendous growth has done in last 50 years ([6], [8]). Most of the problems in fractional Calculus are solved by using various methods like adomain decomposition method, Iterative Method, Hes variational iteration method, etc. which gives us the approximate solutions to these fractional order Differential Equations along with this some mathematician used to solve these problems by analytical methods [8] also which gives the solutions to these equations much faster than it is done in numerical methods with more accuracy. There are several definitions of fractional order derivative ([6], [8]) which are used to solve real life problems. Recently Abdon Atangana and Dumitru Baleanu [1] gave new definition of fractional derivative with Non local and Non Singular kernel with exponential function, using this definition the fractional order Differential Equation can be solved ([14], [15]) along with these Transforms which are used to solve Differential equations also, in [19] the new Transformation has been defined which has relation with Laplace Transform [19].

The paper is organized as follows:

2010 *Mathematics Subject Classification.* 34A25, 26A33, 33C45, 33E12.

Key words and phrases. Transformation, fractional Derivatives, Kummers Hyper geometric function, Mittag Leffler Function.

Submitted June 22, 2016. Revised may 9, 2017.

APPLICATIONS OF NEW CONFORMABLE FRACTIONAL ELZAKI DERIVATIVE

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Abstract: In this paper the, we have proved some properties of 1 – D new conformable fractional Elzaki derivative by using conformable fractional Laplace Transform along with its applications to solve conformable fractional differential equations.

Keywords: Conformable derivative, Fractional integral transformation, fractional derivative

Mathematics – Subject Classification 2010: 26A24, 26A33, 26A99

1) Introduction

Recently, the fractional calculus [4] and various fractional integral transformations [4,7] plays an important role in the field of fractional differential equations [7] with applications in Computational Fluid Dynamics, Artificial Intelligence, Signal Processing, Image Processing, Stochastic processes, Financial Mathematics etc.

The Integral transforms mainly [10,11] Laplace, Fourier, Mellin, , Abel's, Weirstrass, Hilbert, Sumudu, \mathcal{L}_2 , Laplace – Carson, Elzaki – Tarig Laplace – Stieltjes Transformations has being established in well manner mainly used to solve fractional differential equations [10,11,12].

There are several types of fractional derivative definitions including Caputo, Riemann – Liouville, ABC, ABR [7,10,11]. The term conformable fractional derivative [5] having advantageous for getting the solutions of fractional differential equations in analytical form.

The paper mainly divided into 4 parts. In section 1, Definition related to conformable fractional Elzaki Transformation along with its some properties were given. In section 2, conformable fractional transformation of some standard functions were calculated. In section 3, the conformable fractional differential equation were solved by using conformable fractional Elzaki Transformations. Some concluding remarks were given in section 4.

2) Basic Definitions

Definition 1: Conformable fractional derivative

Let $f: [0, \infty) \rightarrow \mathbb{R}$ be a function, then the conformable fractional derivative [5] of f of order α , $0 < \alpha \leq 1$ is defined by,

$$D_t^\alpha f(t) = T_\alpha(f)(t) = \lim_{\varepsilon \rightarrow 0} \frac{f(t+\varepsilon t^{1-\alpha}) - f(t)}{\varepsilon}, \quad \forall t > 0 \quad (1)$$

The simplest relationship between usual and conformable fractional derivative is represented [5] as:

$$T_\alpha(f)(t) = t^{1-\alpha} f'(t), \quad \text{where } f \in C^1 \quad \forall t > 0 \quad (\text{A})$$

Generalized Elzaki – Tarig Transformation and its Applications to New Fractional Derivative with Non Singular Kernel

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Received: 3 Mar. 2017, Revised: 5 Apr. 2017, Accepted: 9 Apr. 2017

Published online: 1 Jul. 2017

Abstract: In this paper, we have defined the new generalized Elzaki – Tarig transformation and find out its relations with other transformations. Furthermore we have derived the inversion formula, convolution theorem for it. Also as an application we have solve fractional differential equation with non – singular kernel.

Keywords: Elzaki – Tarig transform, fractional derivatives.

1 Introduction

Fractional differential equations play an important role in modelling the dynamics of complex systems (see for example Refs. [1,2,3,4,5] and the references therein) The idea of transformations and hyper geometric functions [6] is generally started with the need of converting problems from one form into another form which is rather simpler to solve and then by using inversion formula again coming back to the original form with the solution.

In recent years many linear boundary value problems, initial value problems are effectively solved by these transformations [7,8,9,10] like Laplace, Fourier, Mellin, wavelet and other transformations with applications increasing rapidly in daily life and branches of science like bioengineering, computational fluid dynamics, Abel's integral equations, biomathematics, capacitor theory, conductance of biological systems [11,12]. The Elzaki–Tarig transform [13] which is still not widely known in the area of fractional calculus

In this paper, we have introduced the generalized Elzaki – Tarig transformations with its relation to other transformations in general way. Moreover, as an application we have solved fractional differential equation with non-local and non-singular kernel [7] by using Tarig transformation [10] as a part of generalized definition.

The paper mainly divided into three parts, in the first part we define the generalized Elzaki–Tarig transform and some of its properties, in the second part we have derive the relation of it with other transformations. In the third part, we have provided an application of it to solve fractional differential equations with non-local and non-singular kernel along with the discussion of the obtained result conclusion part ends our manuscript.

In the following we present some basic definitions needed in proving the main results.

Definition 1: Atangana – Baleanu Riemann fractional derivative. Consider a function $f \in H^1(a, b)$, $b > a$, $\alpha \in [0, 1]$ which is of exponential order then the new ABR fractional derivative [7] of $f(t)$ is defined as ,

$${}^{ABR}D_t^\alpha(f(t)) = \frac{B(\alpha)}{1-\alpha} \frac{d}{dt} \left[\int_a^t f(x) E_\alpha \left(-\alpha \frac{(t-x)^\alpha}{1-\alpha} \right) dx \right] \quad b > a, \alpha \in [0, 1] \quad \text{and } B(\alpha) \text{ is normalization function obeying } B(0) = B(1) = 1. \quad (1)$$

Definition 2: Atangana – Baleanu Caputo fractional derivative. Consider a function $f \in H^1(a, b)$, $b > a$, $\alpha \in [0, 1]$ which is of exponential order then the new ABC fractional derivative [7] of $f(t)$ is defined as,

$${}^{ABC}D_t^\alpha(f(t)) = \frac{B(\alpha)}{1-\alpha} \left[\int_a^t f'(x) E_\alpha \left(-\alpha \frac{(t-x)^\alpha}{1-\alpha} \right) dx \right] \quad b > a, \alpha \in [0, 1] \quad \text{and } B(\alpha) \text{ is normalization function obeying } B(0) = B(1) = 1. \quad (2)$$

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Effect of Heavy Metals on Antioxidant Biomarker Enzymes and Biochemical Constituents in Different Tissues of *Lamelleidens marginallis* in Different Reservoirs of Nasik District

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Nat. Env. & Poll. Tech.
 Website: www.neptjournal.com

Received: 07-06-2017

Accepted: 13-07-2017

Key Words:

Heavy metals
 Antioxidant biomarkers
 Biochemical constituents
Lamellidens marginallis
 Reservoirs

ABSTRACT

Heavy metals are known inducers of oxidative stress by directly producing reactive oxygen species (ROS), which leads to formation of LPO and modulate the activities of antioxidant enzymes and causes disturbances in metabolic functions. The modulation of antioxidant enzyme system like superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx), glutathione S-transferase (GST) and concentration of reduced glutathione (GSH) are reported. Accumulated heavy metals also cause conflict in metabolic functions, trigger detoxifying enzymes, and antioxidant system damage leads to oxidative stress and causes damage to protein and other biochemical constituents. In the present investigation, the heavy metals Zn, Cu, Pb and Cd were determined in surface water and the freshwater bivalve *Lamellidens marginallis* collected from Girna, Ozarkhed, Chankapur and Gangapur reservoirs of Nasik district during summer, monsoon and winter seasons to study their effect on the activity of antioxidant enzymes and biochemical constituents like protein and ascorbic acid in soft body tissues of the bivalve.

INTRODUCTION

Occurrence of toxic metals in lakes, ponds, dams, ditches and rivers affect the lives of local people who depend upon these water sources for their daily requirements. Consumption of such aquatic food stuff enriched with toxic metals may cause serious health hazards through food-chain magnification. The supply of quality water remains a major challenge for humanity in the twenty-first century (Schwarzenbach et al. 2010). Research has shown that metals have the ability to bioconcentrate in organisms directly from the water and bioaccumulate and biomagnify within food chains, which causes higher trophic organisms to become contaminated with higher concentrations of chemical contaminants than their prey (Hargrave et al. 2000 and Lee et al. 2000, Boran & Altinok 2010, Shariati et al. 2011). Therefore, heavy metal pollution poses a great potential threat to the environment and human health. Thus, there is a need of regular monitoring of them, not only to prevent diseases and hazards, but also to check the water resources from going further polluted.

MATERIALS AND METHODS

Animals were collected in summer, monsoon and winter seasons from different places of four reservoirs during

November 2010 to October 2011 and their digestive glands were removed and used for estimation of oxidative stress indicator biomarkers. Lipid peroxidation (LPO) was assayed by the procedure of Ohkawa et al. (1979). Reduced glutathione (GSH) was determined by the procedure described by Boyne & Ellmen (1972). The activity of superoxide dismutase (SOD) was determined by the procedure of Paoletti et al. (1990). Catalase activity (CAT) was determined by method according to Aebi (1974). Glutathione peroxidase (GPx) was assayed according to the method of Rotruck et al. (1973). Glutathione-S-transferase (GST) was assessed by the procedure of Habig et al. (1974). The total proteins and ascorbic acid contents were estimated from different soft body tissues like mantle, gills, digestive glands and whole soft body tissue of the bivalve. The tissues were removed and dried at 70° to 80°C in the oven till the constant weight of dry tissues was obtained. From each powder, protein contents were estimated by Lowry's method (Lowry et al. 1951) by using Bovine Serum Albumin (BSA) as standard. Ascorbic acid contents were estimated by the procedure of Roe (1967) using the hydrazine reagent. Results are expressed as mean \pm standard deviation (S.D.).

RESULTS AND DISCUSSION

The concentrations of heavy metals Zn, Cu, Pb and Cd were



RESEARCH ARTICLE

TOXIC EFFECT OF HEAVY METALS ON DNA, RNA AND ASCORBIC ACID CONTENT IN SOFT TISSUES OF THE FRESH WATER BIVALVE *LAMELLIDENS CORRIANUS* FROM DIFFERENT RESERVOIRS OF NASHIK DISTRICT (M.S.)

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Received 20th March, 2018; Accepted 26th April, 2018; Published 18th May, 2018

ABSTRACT

The present study investigates the heavy metals concentrations in surface water and soft body tissues of the freshwater bivalve *lamellidens corrianus* collected from Girma, Ozarkhed, Chankapur and Gangapur reservoirs of Nashik district during summer, monsoon and winter seasons. The mean values of heavy metals Zn, Cu, Pb and Cd concentrations in surface water were highest at Girma reservoir and lowest at Gangapur reservoir. Therefore, it was concluded that Girma reservoir was more polluted than other studied reservoirs. The biochemical components DNA, RNA and ascorbic acid, were estimated from soft tissues of the freshwater bivalve *lamellidens corrianus*. The results showed lowest DNA, RNA and ascorbic acid contents in soft body tissues of bivalve species sampled from Girma reservoir while highest DNA, RNA and ascorbic acid contents were observed in soft body tissues of bivalve species sampled from Gangapur reservoir. This indicated that bivalve species inhabiting at Girma reservoir are under more environmental stress than bivalve species inhabiting at Gangapur reservoir.

Key words: Lamellidens corrianus, Heavy Metals, DNA, RNA, Ascorbic Acid, Reservoirs.

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Citation: Rahane Balasaheb and Bhalla Resham, 2018. "Toxic effect of heavy metals on dna, rna and ascorbic acid content in soft tissues of the fresh water bivalvelamellidens corrianus from different reservoirs of Nashik district (M.S.)" *International Journal of Current Research in Life Sciences*, 7, (05), 2101-2105.

INTRODUCTION

The most important metals from the point of view of water pollution are As, Zn, Cu, Pb Cd, Hg, Ni and Cr (Li *et al.*, 2002). Consumption of aquatic food highly contaminated with heavy metals may form a significant pathway to metal contamination in the human being and creating public health problems wherever man is involved in the food chain (Yigit and Altindag, 2006; Sarabjeet and Dinesh, 2007; Medeiros *et al.*, 2012). Deoxyribose nucleic acid contents can be the index of capacity of an organism for protein synthesis in different stress conditions affected by heavy metals or any toxic metals or pesticides. DNA damage results from exposure to many contaminants and is widely used as an indicator or biomarker of biological effects (van der Oost *et al.*, 2003). RNA is an important molecule with long chains of nucleotides. Alterations in RNA content due to heavy metal exposure was reported by several researchers (Gulbhile, 2006; Nawale, 2008; Srivastava and Verma, 2009; Andhale and Zambare, 2011). Ascorbic acid is important micronutrient, which functions as a factor in several metabolic reactions (Kaya, 2003).

Antioxidant property of ascorbic acid helps to prevent free radical formation from toxic water-soluble molecules which may cause cellular injuries and diseases.

MATERIALS AND METHODS

Four reservoirs of Nashik district were selected for the study. The analysis of metal concentrations in surface water and different body tissue of bivalve was carried out by using Atomic Absorption Spectrophotometer (AAS) (Thermo Scientific, U. K. make, Solaar A series model). The DNA, RNA and ascorbic acid contents were determined from soft body tissues like mantle, gills, digestive glands and whole soft body tissues of *Lamellidens corrianus*, collected seasonally during November 2010 to October 2011 from four water reservoirs of Nashik district. DNA content of the tissue was estimated by using Diphenylamine method of Burton (1956). RNA content of the tissue was estimated by following Orcinol method of Volk in and Cohn (1954). Estimation of ascorbic acid was carried out by the method of Roe (1967). Results are expressed as mean \pm standard deviation (S.D.). The ANOVA test was used in order to access whether biochemical constituents are varied significantly between the reservoirs, seasons and bivalve species.

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Ecology, Environment and Conservation Paper

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TOXICANT STRESS ON PROTEIN AND ASCORBIC ACID CONTENTS IN DIFFERENT TISSUES OF FRESHWATER BIVALVE *PARREYSIA CYLINDRICA* FROM DIFFERENT RESERVOIRS OF NASHIK DISTRICT,INDIA

Balasaheb Rahane and Resham Bhalla

Abstract

In the present investigation the biochemical constituents like protein and ascorbic acid contents were determined from soft body tissues like mantle, gills, digestive glands and whole soft body tissues of the freshwater bivalve species, *Parreysia cylindrica* inhabiting the four reservoirs of Nashik district during summer, monsoon and winter seasons. The heavy metals Zn, Cu, Pb and Cd concentrations were determined in surface water and the freshwater bivalve *Parreysia cylindrica* were collected from Girna, Ozarkhed, Chankapur and Gangapur reservoirs. The results showed lowest protein and ascorbic acid contents in soft body tissues of *Parreysia cylindrica* sampled from Girna reservoir, while highest protein and ascorbic acid contents were observed in soft body tissues of the bivalve species sampled from Gangapur reservoir. This indicated that bivalve species inhabiting at Girna reservoir are more under environmental stress than bivalve species inhabiting at Gangapur reservoir. These results clearly indicated that Girna reservoir was more polluted and Gangapur reservoir was less polluted than other reservoirs. Therefore, measurement of important biochemical constituents such as protein and ascorbic acid can be used as susceptible bio markers for the bio monitoring of heavy metal pollution in freshwater ecosystem.

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[Shopping Bag \(Items \)](#)[Home](#)[International Journals](#)[For Authors](#)[Books](#)[About Us](#)[Contact](#)**Asian Journal of Microbiology, Biotechnology & Environmental Sciences Paper****Vol 20, Issue 2, 2018; Page No.(635-642)**[Back](#)**EFFECT OF HEAVY METALS ON ENZYME ACTIVITY IN THE DIGESTIVE GLANDS OF FRESHWATER BIVALVE, PARREYSIA CYLINDRICA FROM DIFFERENT RESERVOIRS OF NASHIK DISTRICT, INDIA**

RAHANE BALASAHEB AND BHALLA RESHAM

Abstract

The heavy metals Zn, Cu, Pb and Cd concentrations were determined in surface water and the freshwater bivalve *Parreysia cylindrica* were collected from Girna, Ozarkhed, Chankapur and Gangapur reservoirs of Nasik district during summer, monsoon and winter seasons. The oxidative stress indicator parameters like activity of antioxidant enzymes (Catalase (CAT), Superoxide dismutase (SOD), Glutathione peroxidase (GPx), and Glutathione-S-transferase (GST), the levels of antioxidant scavenger molecules, reduced glutathione (GSH) and lipid peroxidation (LPO) were estimated from digestive glands of the freshwater bivalve *Parreysia cylindrica*. The results demonstrate that the level of LPO and activity of GST were lowest and activity of antioxidant enzyme CAT, GPx and SOD were highest at Gangapur reservoir and lowest at Girna reservoir. The results also indicates that the level of LPO and activity of GST were lowest and CAT, GPx and SOD activity were highest in monsoon, while level of LPO and activity of GST were highest and CAT, GPx and SOD activity were lowest in summer season at four reservoirs in digestive glands of *Parreysia cylindrica*. The mean values of heavy metals Zn, Cu, Pb and Cd concentrations in surface water were highest at Girna reservoir and lowest at Gangapur reservoir. Therefore it was concluded that Girna reservoir was more polluted than other studied reservoirs.

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Protein, Ascorbic Acid and Antioxidative Enzymes Alterations In The Digestive Gland of *Lamellidenscorrianus* Due to Heavy Metals from Different Reservoirs of Nashik District. (M.S.)

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ABSTRACT

The heavy metals Zn, Cu, Pb and Cd concentrations were determined in surface water and the freshwater bivalve *lamellidens corrianus* were collected from Girna, Ozarkhed, Chankapur and Gangapur reservoirs of Nashik district during summer, monsoon and winter seasons. The biochemical components proteins, ascorbic acid and oxidative stress indicator parameters like activity of antioxidant enzymes (catalase (CAT), superoxide dismutase (SOD), glutathione peroxidase (GPx), and glutathione-S-transferase (GST), the levels of antioxidant scavenger molecules, reduced glutathione (GSH) and lipid peroxidation (LPO) were estimated from digestive glands of the freshwater bivalve *lamellidenscorrianus*. The results demonstrate that the level of proteins, ascorbic acid, LPO and activity of GST were lowest and activity of antioxidant enzyme CAT, GPx and SOD were highest at Gangapur reservoir and lowest at Girna reservoir. The results also indicates that the level of LPO and activity of GST were lowest and CAT, GPx and SOD activity were highest in monsoon, while level of LPO and activity of GST were highest and CAT, GPx and SOD activity were lowest in summer season at four reservoirs in digestive glands of *lamellidenscorrianus*. The mean values of heavy metals Zn, Cu, Pb and Cd concentrations in surface water were highest at Girna reservoir and lowest at Gangapur reservoir. Therefore, it was concluded that Girna reservoir was more polluted than other studied reservoirs.

Keywords: *Lamellidenscorrianus*, heavy metals, proteins, ascorbic acid, antioxidant enzymes.

I. INTRODUCTION

Consumption of aquatic food highly contaminated with heavy metals may form a significant pathway to metal contamination in the human being and creating public health problems wherever man is involved in the food chain (Otitoloju and Don-Pedro, 2004; Lodhi et al., 2006; Yigit and Altindag, 2006; Sarabjeet and Dinesh, 2007; Medeiros et al., 2012). The toxicant bioaccumulation became a topic of public and scientific concern early in the 1950s (Barron, 2003). Heavy metal pollution poses a great potential threat to

the environment and human health. A wide range of metal pollution or stresses are also responsible for the secretion or suppression of the proteins (Iwata et al., 1998 and Kohler et al., 2001) in the body of organism. Ascorbic acid is well known to inhibit oxidative damage against metal toxicity (Houston and Johnson, 2000; Rao et al., 2001; Nandi et al., 2005). Ascorbic acid helps to maintain the oxidation-reduction potential of the cell at the stabilized level. Antioxidant property of ascorbic acid helps to prevent free radical formation from toxic water-soluble molecules which may cause cellular injuries and diseases. The study of antioxidant enzymes in conjunction with trace metal

Effect of L-Ascorbic Acid on Lambdacyalothrin Induced Alterations in The Lipid Contents in Different Tissues of the Freshwater Bivalve, Lamellidens Marginalis (Lamarck)

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ABSTRACT

The present study investigates the effect of Lambdacyalothrin induced alterations in lipid level of gills, gonads and digestive gland tissues and its possible recovery by treating with L-Ascorbic acid in the fresh water bivalve, Lamellidens marginalis after chronic exposure. The freshwater bivalve Lamellidens marginalis were exposed to chronic dose of Lambdacyalothrin (0.75 PPM LC50/2 values of 96 hours) alone and in combination with 50mg/L L-ascorbic acid for 21 days. Lipid contents in the gills, gonads and digestive gland of Lambdacyalothrin and Lambdacyalothrin with 50mg/L L-ascorbic acid exposed bivalve, Lamellidens marginalis showed remarkable increase in lipid content as compared to control. The increased level of lipid was observed in digestive glands as compared to other tissues. Exposure to pesticide Lambdacyalothrin in combination with 50 mg/L of L-ascorbic acid showed considerable increase in the lipid levels. Lipid content was found to be more in different tissues exposed to Lambdacyalothrin without ascorbic acid as compared to Lambdacyalothrin with ascorbic acid. Fast recovery of percent lipid contents was observed in presence of L-ascorbic acid than the recovery in the normal freshwater. This study indicates the protective and curative property of the L-ascorbic acid against the Lambdacyalothrin induced damage.

Keywords: Bivalve, Lamellidens marginalis, Lambdacyalothrin, L- Ascorbic acid, Lipid alterations.

INTRODUCTION:

The aquatic environment has always been subjected to different types of pollutants of industrial, domestic and agricultural wastes. (Farkas et. al., 2000). The aquatic ecosystems are very sensitive to pesticide pollution and this is a primary problem due to their persistence as they are not removed by biodegradation. The use of pesticides has resulted in increased crop production and other benefits and has raised concerns about potential adverse effects on the environment and human health. The chemicals which are used for pest management cause deleterious effects on the environment as they ultimately affect the non-target and useful organisms (Nimmo, 1985). Pesticide such as Lambdacyalothrin is a potential problem for aquaculture in developing countries. Lambdacyalothrin is highly toxic to aquatic invertebrates, when absorbed through the mucous membrane of the respiratory tract, resulting in systemic intoxication. Freshwater bivalves provides significant role in providing source of food for human being and other aquatic birds from all over the world. (Malathi and Thippeswamy, 2013). Now-a-days, decline of freshwater mussels is observed due to several factors such as siltation, pollution, commercial harvest, and construction of dams. Exposure assessment is essential in understanding the potential effects of contaminants to non-target animal populations, like mussels which are considered to be excellent indicator organisms for reflecting bio-available concentrations of environmental contaminants (Jayakumar et. al., 2008). Lipids are the most important source of energy in the absence of carbohydrates. This essential nutrient is drastically affected and altered by various environmental pollutants like pesticides. Pesticides are known to induce severe impairment in lipid transport and metabolism which may lead

Section Original Articles

Seasonal variation of cestode parasite Raillietina in an edible bird Gallus domesticus (L.)

<https://doi.org/10.36953/ECJ.2018.19310> (<https://doi.org/10.36953/ECJ.2018.19310>)

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Submitted

May 20, 2018

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PLANKTON DIVERSITY IN THE GANGAPUR DAM OF NASHIK DISTRICT MAHARASHTRA

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ABSTRACT

During the present investigation Plankton diversity of Gangapur dam in Nashik district was studied Among planktonic groups *Cynophyceae* dominated(38.04 percent), followed by *Chlorophyceae* (35.16 percent), *Copepoda* (11.14 percent), *Bacillariophyceae* (5.37 percent), *Cladocera* (4.04 percent), *Rotifera* (3.85 percent) and *Ostracoda* (2.40 percent) of the total planktonic population during year 2004-05.

Key words: Plankton diversity, Gangapur dam, Maharashtra.

INTRODUCTION

The term "Plankton" refers to those minute aquatic forms which are non motile and living suspended in the pelagic water. Those of plant origin are called phytoplankton the producers belonging to first trophic level while those of animal origin are the zooplankton the primary consumers belonging to second trophic level.

To monitor the aquatic ecosystems, plankton has been used recently as bioindicator (Beaugrand et al., 2000). Phytoplankton forms the very basis of aquatic food chain. They are ecologically significant as they trap radiant energy of sunlight and convert into chemical energy.

Zooplankton of freshwater comprise of Protozoa, Rotifers, Cladocerans, Copepods and Ostracods. Zooplanktons serve as food for fishes directly or indirectly. Several zooplankton species have been classified as indicative of polluted conditions like *Keratella*, *Branchionus*, *Cephalopoda*, *Monostyla*, *Bosminia*, *Cyclops*, *Adona* and several members of group Protozoa (Rawson 1956 and Pennak 1978). The aim of the present investigation is to know the plankton diversity in the water of Gangapur Dam in Nashik District of Maharashtra. The Investigation was made for the period of two years i.e., January 2004 to December 2005.

RK

DETERMINATION OF HEAVY METALS (ARSENIC, CADMIUM AND LEAD) FROM DIFFERENT BODY LOTIONS***Dr. Patil Anita Parashram**

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Article Received on
16 August 2017,

Revised on 07 Sept. 2017,
Accepted on 26 Sept. 2017

DOI: 10.20959/wjpr201712-9780

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ABSTRACT

In this work we analysed some mostly used body lotion available in market. The samples are collected of different types. Here the deviation is observed in amount of metals present in product (body lotions). In this study we found that some body lotion contain high amount of heavy metals beyond WHO limit. The cosmetics were analysed for heavy metals (Arsenic, Cadmium, Lead) after digestion with aquaregia solution. The concentration of the selected toxic heavy metals was determined in duplicate using atomic absorption spectrophotometer. The samples analysed for amount of the metals of interest. The concentration of the heavy metals in the samples ranged from 0.046 to 18.46 ppm. It is obvious from the present study that the use of some cosmetic products expose users to low concentrations of toxic heavy metals which could constitute potential health risk to users, since it has known that heavy metals can accumulate in the biological

system over time and are known to induce skin problem or diseases such as cancer. Further research to better understand the sources of heavy metals in cosmetic product is recommended. It has been shown that heavy metals toxicity to humans is as a result of long term or high level exposure to pollutants common in the environment including the air, water food and numerous consumer products such as the cosmetics and toiletries. In this study we assessed the levels of toxic metals in different cosmetics product sold at local shops in Nashik.

KEYWORDS: heavy metals, toxicity, body lotions, pollutants.

Phytoplankton Diversity Observed in Gangapur Dam at Nashik District, Maharashtra

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ABSTRACT

Water is one of the vital factor in the existence of living organisms. Algae are frequently found in polluted and unpolluted water and due to this behaviour they are generally considered useful to determine the quality of water. The hydro-biological study of Gangapur Dam was done for two years (January 2004 to December 2005). During the study the Algal genera belonging to Chlorophyceae, Cyanophyceae, Bacillariophyceae and Euglenophyceae were recorded. Members of Chlorophyceae dominated the algal flora of Gangapur Dam.

Keywords: Algae, Chlorophyceae, Phytoplankton, Diversity.

INTRODUCTION:

Phytoplankton is a predominant type of a plant found in all natural waters as well as in artificial impoundments. The quality and quantity of phytoplankton is a good indicator of water quality. The high relative abundance of Chlorophyta is an indicator of productive water (Boyd 1981).

The objectives of this study is to determine the diversity of phytoplankton observed in the water and also to study the pollution status of water of Gangapur Dam ,an earthen dam in Nashik district.

MATERIALS AND METHODS:

The present study was conducted for a period of two years from January 2004 to December 2005. Plankton samples were collected every month from Gangapur Dam from three stations A, B and C. Plankton was collected by filtering 50 litres of water through a standard planktonic net and analysed in the laboratory (Nair et. al., 1971; Dutta 1983; Kudo 1986 and Edmondson, 1992) and counted by drop count method. The results were expressed as number per litre (n/l).

POLLUTION INDEX:

The pollution tolerant genera and species of algae were recorded for each sampling station. Most frequent twenty genera were taken into account (Palmer, 1969). The pollution index was calculated for all stations. Following numerical values have been followed-

0-10 – Lack of organic pollution.

10-15 – Moderate pollution.

15-20 – Probable evidence of high org. pollution.

20 or more – High organic pollution.

RESULTS AND DISCUSSION:

Phytoplanktons collected from the Gangapur Dam water mainly belongs to class Chlorophyceae, Bacillariophyceae and Cyanophyceae while those belongs to class Euglenophyceae and Dynophyceae scarcely occurred. Phytoplanktonic qualitative analysis has revealed the presence of 22 species of Bacillariophyceae, 18 species of Chlorophyceae, 11 species of Cyanophyceae, 3 species of Euglenophyceae and 2 species of Dinophyceae.

Influence of Firing Temperature on Nature of Screen Printed WO₃ Thick Films

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ABSTRACT

This study focuses on the effect of firing temperature on the nature of tungsten trioxide thick film made by screen printing process for gas sensing application. X-Ray diffractometer (XRD) is used to analyze the phases formed after firing. XRD result shows that a mixture of monoclinic, orthorhombic phases of WO₃ was observed in the range 600-700°C. The morphology was analysed by SEM-EDS. The D.C. resistance of the films was measured by half bridge method in air atmosphere at 30-450°C temperature range. The films showed decrease in resistance with increase in temperature indicating semiconductor behaviour. The TCR, activation energy and sheet resistivity, surface to bulk ratio of films were evaluated at different firing temperatures. The film fired at 600°C was used for gas sensing purpose since the surface-to-bulk ratio is much greater than the film fired at other temperatures.

Keywords: WO₃, XRD, TCR, activation energy.

INTRODUCTION:

WO₃ is an n-type semiconductor with a reported band gap of about 2.6 -2.8 eV [1] WO₃ has perovskite-type ABO₃ lattice with A site, which remains unoccupied site. The WO₃ is considered as oxygen-deficient or non-stoichiometrical oxide has many oxidation states i.e 2,3,4,5 and 6. The crystal structure of tungsten trioxide is temperature dependent, shows five phase transitions in accordance to the following sequence : It is tetragonal at temperatures above 740 °C, orthorhombic from 330 to 740 °C, monoclinic from 17 to 330 °C, and triclinic from -50 to 17 °C . Hexagonal tungsten trioxide is an intermediate meta-stable form of WO₃. Such electronic properties make the tungsten oxides suitable for gas sensors [2]. The aim of present work is to prepare WO₃ thick films by screen printing technique on alumina substrate and to investigate its characteristics when subjected to different firing temperature.

EXPERIMENTAL:

Powder, paste and thick film preparation:

The WO₃ powder (Sigma Aldrich, AR grade, purity 99.99 %) was weighed and calcined in air at 4500C for 1_2^1 hrs. The calcined WO₃ powder was crushed and mixed thoroughly with glass frit as permanent binder and ethyl cellulose as a temporary binder. The mixture was then mixed with butyl carbitol acetate as a vehicle to make the paste. The paste was used to prepare thick films on alumina substrate by using standard screen printing technique [3-4]. After the printing, sensors were left at room temperature for a couple of hours so as to

Mechanochemical Synthesis, Characterization and Photocatalytical Degradation of Methyl Orange by Nano-ZnO

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ABSTRACT

Nanosized ZnO particle were synthesized by using a mechanochemical method. The Morphological, Compositional and Structural properties of the ZnO thick films were performed by Scanning electron microscopy (SEM), Energy Dispersive Spectroscopy (EDAX) and XRD technique respectively. Chemical composition of nano ZnO film samples changes with firing temperature showing non-stoichiometric behaviours. XRD study indicated the formation of polycrystalline ZnO films with hexagonal wurtzite structure. The effect of catalyst loading, pH value, and initial concentration of methyl orange on the photocatalytic degradation efficiency using ZnO particle as photocatalyst were discussed.

Keywords: Degradation; Methyl orange; Photocatalysis; Zinc oxide.

INTRODUCTION:

Zinc oxide is widely used in number of application like photocatalysis [1], gas sensor [2], varistors [3], low voltage phosphor material [4] and so on. In order to realize the universal application of nanomaterials, the key is to devise simple and efficient methods for preparing nonmaterial on a large scale at low cost [5]. ZnO nanoparticles can be prepared on a large scale at low cost by simple solution-based synthesis methods, such as chemical precipitation [6], sol-gel [7] and solvothermal, hydrothermal reaction. Number of other methods such as photochemical, electrochemical and chemical reduction, microwave processing [9], gamma irradiation [10], ion irradiation [11] and plasma processing, radiolysis, ultra sound processing also helps in synthesizing nanoparticles. ZnO is a II-VI semiconductor material with a wide direct band gap (3.37 eV) and relatively high exciton binding energy (60 meV) at room temperature. It has attracted considerable attention with respect to degradation of various pollutants such as acid red 18 [12], 4-nitrophenol [13], acridine orange[14], methyl orange)[15], and so on, due to its being relatively cheap, chemical stability and high photocatalytic efficiency [16].

Methyl orange (MO) is an azo dye and has been widely used in textiles, foodstuffs, paper and leather industries. However, the release of MO and its products in the environment cause serious pollution problems. The photocatalytic treatment of waste waster containing dyes has also been well documented [17,18]. ZnO has attracted much attention with respect to the degradation of various pollutants because of its high photosensitivity. Researchers have highlighted the performance of ZnO on degradation of some organic compounds [19, 20]. It is well known fact, the highly reactive OH[•] radicals and electron holes are generated on the surface of photocatalyst under the irradiation with UV light. Therefore, the surface characteristic of ZnO determined by the different methods will influence this property as well as the final degradation efficiency. The particle size of photocatalyst is one of the most important factors. The aim of the study is to optimize the preparation of ZnO nano particle as a photocatalyst. The photocatalytic activities were evaluated using methyl orange (Scheme 1) as a model organic compound.

Design Consireations in all Types of Solar PV Applications

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ABSTRACT

Solar Energy is major generation source of electric energy in countries where Sun is available uniformly over an average 8 Hours per day and nearly at least 300 days out of 365 days. Due to every day decrease in solar PV panel's prices, thanks to China's over production of solar panels and installed capacity of manufacturing solar panels. To absorb free solar energy for the need of use in different fields such as House hold, Roof Top, Floating solar, Off grid solar PV for rural villages and Hybrid applications with Bio Gas, wind energy and commercial applications such as Grid tied solar farms developed with soft loans from IMF . ADB and other commercial Funds such as Gold sach, bettervest, Germanys KFW and DEG, Indian Renewable Development Agency IREDA etc. The purpose of this paper is to provide tools and guide line to any installer of solar PV application and give view of all technologies available for Solar PV applications in different areas of life and enhance utilization of clean energy including transport (electrical vehicle) field. The discussion in this paper includes design consideration right from calculating user loads, calculation of back up time, commercial analysis, available area for solar PV installation, selection of components such as Solar Panels, structures, MMPT controllers, batteries, Inverters, cables and accessories.

Keywords: Solar PV, Rooftop, Grid connected solar, Floating Solar, micro grid, Battery charger, Inverter, Reverse Bidding.

INTRODUCTION:

The use of electricity increasing with enhancement in lifestyles, industrialization across the world and need for electrical energy demand from clean energy sources such solar and wind and another renewable energy sources compared to conventional fossil fuel like coal, natural gas or oil, diesel based generators. Fortunately India is positioned at geological map of world with very good conditions for the development of Solar Photovoltaic Power Systems mainly due to very good average daily radiation and more than 90% of Sunny days in most of regions of the India throughout the year¹. For this reason States like Delhi, Tamilnadu, Gujarath, Andhra Pradesh, Utter Pradesh are developing policies for investment in solar PV, net metering, rooftop (House hold and commercial and Industrial). Rooftop solar³ can be installed faster than other types of renewable power plants and due to lack of moving parts are quiet, visually non obstructive, clean and the owner even won't know rooftop solar plant is in operation there. Solar Panels which converts solar radiation in to electricity is very reliable and clean source of electrical energy that can be used for various applications such as Residential, Industrial, commercials such as malls, shops, agriculture such as solar pumping application and Live stock such as Poultry, cold storage, food processing etc. application. The PV system design mainly depends up on the users Load requirement and the space available without shadows and generally panels are kept with 25 to 60 degrees inclination depending up on the locations solar radiation⁴. Normally 100 sq. feet is required for 1 KW of panels installations. In cities the tall building nearby shadows nearby building. The town planning department must not allow uneven heights of building in future considering solar PV applications. Once the installation capacity is fixed with connected loads and available space for solar panels installation, calculations are done for sizing of panels with efficiency and

Study of Screen Printed MoO₃ Thick Films as NH₃ Sensor

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ABSTRACT

In this paper, gas sensing property of a MoO₃ was studied. Thick films of MoO₃ were prepared on alumina substrate by screen printing method and fired at 600°C. The structural behavior, surface morphology was studied by XRD, SEM and EDAX techniques respectively. From XRD the crystallite size was calculated using Scherer's formula and observed as 19.97nm. From SEM the particle size was observed as 45nm to 156nm. EDAX analysis shows non-stoichiometric behavior of the films. Gas sensing behavior of the films was tested in static gas sensing system. Current flowing through the films was measured in air and then in different gases atmosphere at different temperatures. Films were exposed to different gases as LPG, NH₃, NO₂, Ethanol vapour and CO. At 200°C, MoO₃ films showed good sensing for NH₃. The gas sensitivity was determined as 67.3% for 1000 ppm of NH₃. The films showed good response and recovery time.

Keywords: MoO₃; XRD; SEM; Sensitivity; Selectivity.

INTRODUCTION:

Transition metal oxides like TiO₂, WO₃, and MoO₃ are very promising materials in the field of sensors, catalysts, display devices, high density memory devices and optical smart windows [1-6]. Solid-state semiconducting gas sensors have been extensively investigated because of their wide range of applications. MoO₃ is a wide band gap (E_{gap} ~3.1 eV) n-type semiconductor. Recently semiconducting MoO₃ films have shown potential as new gas sensing element. In this study, MoO₃ films were prepared by screen printing method. Screen printing method was employed for film preparation since the method is relatively easy and low cost. [7]. The NH₃ gas sensing behavior of MoO₃ films is studied.

EXPERIMENTAL WORK:

The MoO₃ powder (AR grade, 99.99 %) was weighed and calcinated in air at 400°C for 2 hrs. The calcinated MoO₃ powder was crushed and mixed thoroughly with glass frit as permanent binder and ethyl cellulose as a temporary binder. The mixture was then mixed with butyl carbitol acetate as a vehicle to make the paste. The paste was used to prepare thick films on alumina substrate by using standard screen printing technique using screen of 40s, mesh no. 355 [7]. After screen printing, the films were dried under IR-lamp for 45 minutes and then fired at temperatures of 600°C for 1 hour. Structural and Morphological Studies using X-ray diffraction (Miniflex Model, Rigaku, Japan) analysis from 20-80°, 2θ was carried out to examine the final compositions of the MoO₃ thick films samples. The average grain sizes of MoO₃ thick film samples were calculated by using the Scherer formula [7]:

$$D = \frac{0.9\lambda}{\beta \cos \theta}$$

Where D is the average grain size, λ = 0.1542 nm (X-ray wavelength), and β is the peak FWHM in radiation and θ is diffraction peak position. The surface morphology and chemical composition of the films were analyzed using a scanning electron microscope [SEM model JEOL 6300 (LA) Germany] coupled with an energy dispersive spectrometer (EDS JEOL, JED-2300, Germany). The gas sensing studies were carried out on a static gas sensing system under normal laboratory conditions. The NH₃ gas response of MoO₃ thick films was studied in test assembly. The electrical resistances of MoO₃ films in air (R_a) and in the presence of MoO₃ gas (R_g) were measured to evaluate the gas response (S) given by the relation [8]

Study of Morphological and Gas Sensing Properties of Synthesized Un-doped Iron Oxide Films

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ABSTRACT

In following study we synthesized iron oxide by co-precipitation method. Films of iron oxide were prepared using screen printing method. Morphological properties have been studied using SEM and EDS technique. SEM image clearly shows the spherical particles and porosity in film which will support the gas adsorption. EDS study showed the weight % distribution of Fe and O atoms. Electrical properties of the films were studied with varying temperature. Static gas sensing apparatus was used to study response of films for various toxic gases. Thus prepared films sensed Ethanol vapors more than other four gases.

Keywords: Iron Oxide, co-precipitation method, SEM, EDS, Ethanol vapors.

INTRODUCTION:

Iron Oxide is one of the prominent Nano-materials. It has been used in many applications as drug delivery, pigmentation, water purification, magnetic data storage, magnetic resonance imaging and gas sensing. Fe₂O₃ is the most stable phase of iron oxide. It has energy gap of 2.1 eV, which may get modified due to adsorption and material may act as semiconductor. This semiconductor-like behavior of metal oxide is the basis for its use as gas sensor.[1]

Our goal in this work is to study morphological and gas sensing properties of iron oxide films. We used co-precipitation method for synthesis of iron oxide. We studied morphological and electrical properties of films. We tried to correlate these properties with gas sensitivity of the sample.

EXPERIMENTATION:

Synthesis:

Iron oxide was prepared using co-precipitation method. All used chemicals were of analytical grade. No further purification was done for chemicals. At room temperature 150ml (DDW) water was used to dissolve 10 gm of FeCl₃ 6H₂O with continuous stirring. A pre-prepared 1:1 solution of NH₄OH and H₂O solution was added drop wise with stirring. The PH of 10 was maintained throughout synthesis. The dispersion was then stirred for 1 hr. and then heated at 80 °C for 2 hrs. This resulted into a brown powder. Thus prepared powder was finally calcined at 500 °C for 4 hrs. in a furnace.[2]

Film preparation:

Screen printing method was used for preparation of thick films. Alumina was used as a substrate. Organic and inorganic materials were used in 70:30 wt. proportion [3]. Analytical grade materials were used without further purification.

BCA was added dropwise and proper viscosity was achieved. Thus prepared paste was used to prepare films. Films were dried under IR light for about 15 minutes. Afterwards films were calcined at 700°C constant temperature in a furnace and then allowed to cool in air.

Morphological Characterization:

SEM: The scanning electron microscope [Model JOEL 6300(LA) Germany] at North Maharashtra University

Study of Structural and Electrical Characteristics of Screen Printed TiO₂ Thin Films Prepared by Spray Pyrolysis

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ABSTRACT

Thick films of 0.1M TiO₂ were prepared by spray pyrolysis technique on glass substrate and fired at 400°C in air. The resistivity, activation energy and temperature coefficient of resistance (TCR) are evaluated. The structural behavior, surface morphology was studied by XRD, SEM and EDAX techniques respectively. From XRD the crystallite size was calculated using Scherer's formula and observed as 30nm. The resistivity of films was calculated as 7.2x10⁴Ωm. The TCR was evaluated as 0.0118/°C. From Arrhenius-type plots, the activation energy was determined. Arrhenius-type plots for the electrical conductivity indicate the presence of at least two different conduction mechanisms. The activation energy at low and high temperature region was observed as 0.47eV and 0.2945 eV respectively.

Keywords: Screen Pyrolysis; TiO₂; Resistivity, TCR

INTRODUCTION:

Titanium oxide (TiO₂) has been studied due to its wide range of applications which include photocatalysis, heterogeneous catalysis, energy storage, solar cell components, corrosion-protective coatings and optical coatings [1–5]. Titanium dioxide can be synthesized in three crystalline phases: rutile, brookite and anatase [6]. Several deposition methods have been used to grow undoped and doped TiO₂ films such as Spray pyrolysis, Vacuum evaporation, chemical vapor deposition, magnetron sputtering, pulsed laser deposition, sol-gel technique, screen printing technique [7]. Spray pyrolysis is a physical method, which is relatively simple, reproducible, size controllable, low cost and continuous for synthesis of some nano metal oxides, mixed metal oxides and metals on metal oxides [8]. Thick film resistivity can be controlled by the deposition process to sufficiently low value. Its electrical conductivity is mainly due to Titanium excess at interstitial position. The electrical properties of thick films are functions of several factors [9] such as ingredients, manufacturing technique and sintering history. The present work deals with preparation procedure of 0.1M TiO₂ thin films by spray pyrolysis technique and study their electrical and structural properties.

EXPERIMENTAL WORK:

Thin films of TiO₂ were prepared by using 0.1 M TiCl₄ as precursor for TiO₂ films. TiCl₄ was dissolved in 10 ml of ethanol and then mixed in 90 ml double distilled water. The final solution was stirred for 30 minutes. The prepared precursor solution was sprayed on pre heated glass substrate with spray interval of 10 seconds. The temperature of substrate was maintained at 400°C. These films were fired at 400°C for two hours in air atmosphere. Thin films were characterized by XRD and SEM to study the structural properties. The thickness of the grown films was measured by SurfTest SJ 301 profilometer. The average crystallite size was calculated from XRD pattern using following Debye Scherer's formula [9],

$$D = \frac{0.9\lambda}{\beta \cos \theta} \quad \dots\dots\dots(1)$$

where, β = Full angular width of diffraction peak at the at half maxima peak intensity.
 λ = wavelength of X-radiation.

The D.C. resistance of the films was measured by using half bridge method in an air atmosphere at different

Preparation and Characterization of Titania Thick Film Resistors

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ABSTRACT

Titania (TiO₂) thick films prepared by standard screen printing technique and fired at different temperatures in air atmosphere. The compositional, morphological and structural properties of films were analyzed by Field Emission scanning electron microscopy (FESEM), Energy dispersive spectroscopy (EDS) and X-ray diffraction (XRD). The films were observed to be oxygen deficient, it indicates that the films are non- stoichiometry in nature. As deposited and fired films were analyzed using SEM to know its surface morphology. XRD showed the polycrystalline nature having anatase and mix anatase-rutile structure. The crystallite size changes from 25.1695 nm to 62.3517nm for strong orientation (101) with increase in firing temperature. The role of firing temperature on electrical resistivity has been studied and showed decrease in resistance with increase in temperature.

Keywords: Thick films, FESEM, XRD, Structural properties, Electrical properties.

INTRODUCTION:

Screen printing technique was introduced in the later part of 1950's to produce compact, robust and relatively inexpensive hybrid circuit for many purposes. Later on thick film technique has attracted by the sensor field [1]. Thick films are suitable for gas or humidity sensors since the gas sensing properties are related to the material surface and the gases are always adsorbed and react with the films surface [2]. Screen printing is simple and economical method to produce thick films of various materials [3-10]. The semiconducting metal oxides such as TiO₂, SnO₂, ZnO, Fe₂O₃, and WO₃ etc. offer the potential for developing portable and inexpensive gas sensing devices, which have advantages of simplicity, high sensitivity and fast response. The sensor is a device senses input signal. The working principle of these semiconductor gas sensors is based on change in conductivity when exposed to the target gases [11]. TiO₂ is a widely studied transition metal oxide and behaves as n-type semiconducting oxide due to non-stoichiometry. It has been widely studied for several applications in photoelectrical and optical fields and used as gas sensor. Several deposition methods have been used to grow TiO₂ films such as Spray pyrolysis, Vacuum evaporation, chemical vapor deposition, magnetron sputtering, pulsed laser deposition, sol-gel technique, screen printing technique [12]. Titanium dioxide can be synthesized in three crystalline phases: rutile, brookite and anatase [13]. TiO₂ in the anatase crystalline phase is one of the most studied materials for photo catalysis properties than rutile. Among the various metal oxides that can be used in gas sensors,

Sensing Behavior of Screen Printed Nanocrystalline Copper Oxide Thick Films in Presence of H₂S Atmosphere

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ABSTRACT

In the present endeavour, CuO nanoparticles were synthesized using sol gel method by sintered at higher temperature 400°C. Nanocrystalline copper oxide (CuO) thick films were deposited on glass substrate by using screen printing technique. Prepared films were characterized by XRD, FTIR, SEM, and EDS for their structural, crystalline size, and morphological properties. The nanoparticles size calculated by Scherer formula for CuO was found to be 19.27nm. The scanning electron microscopy shows prepared material is highly crystalline and showed a homogeneous surface with voids and cavities in various sized nanoparticles. EDS analysis confirms the fundamental elemental composition of copper oxide material. FT Infra-red studies show a characteristic Cu-O stretch for prepared copper oxide. Thick films prepared by screen printing technique were utilized for H₂S sensing. Prepared CuO thick films found to be sensitive towards H₂S gas. The sensitivity of copper oxide films to H₂S was observed as 87% at gas concentration of 100 ppm at room temperature (40°C). Prepared films were showed good response and recovery time.

Keywords: CuO, Gas sensitivity; Screen printing technique; H₂S; XRD; FTIR; SEM, and EDS.

INTRODUCTION:

Hydrogen sulfide has a very low odor threshold, with its smell being easily perceptible at concentrations well below 1 part per million (ppm) in air. The odor increases as the gas becomes more concentrated, with the strong rotten egg smell recognizable up to 30 ppm. Above this level, the gas is reported to have a sickeningly sweet odor up to around 100 ppm. However, at concentrations above 100 ppm, a person's ability to detect the gas is affected by rapid temporary paralysis of the olfactory nerves in the nose, leading to a loss of the sense of smell. This means that the gas can be present at dangerously high concentrations, with no perceivable odor. Prolonged exposure to lower concentrations can also result in similar effects of olfactory fatigue. This unusual property of hydrogen sulfide makes it extremely dangerous for human being, so it is necessary to control and monitor H₂S gas in the environment [1-5].

Copper oxide (CuO) is also known as cupric oxide. CuO nanomaterials have grown substantially due to its direct band gap, low cost fabrication and good electrochemical properties. CuO is intrinsic p-type semiconductors with relatively small band gap 1.2eV. [6]

Copper oxide nanoparticles have many attractive properties that can be utilized in a different application such as solar cells, as catalytic support materials, as solid-state chemical sensors, solar energy transformation, magnetic storage media, photocatalyst, optoelectronics and potential applications in various fields.

In the present work the synthesis and characterization of copper oxide CuO nanoparticles powder by sol gel method and its sensitivity to H₂S gas at low temperature on prepared thick films were studied.

A Matlab Framework Simulation: Real Time Monitoring and Analysis for Chemical Sensor Films of Lanthanum Oxide (La_2O_3) and Cerium Oxide (CeO_2)

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ABSTRACT

The main objective of a MATLAB framework is to design an autonomous simulation system to monitor real time characterization of chemical sensor films. This system is beneficial to determine the different parameters of the chemical sensor films.

We are presenting the work related to framework consist of an interface instrument DAQ card combined with the software tool supported by MATLAB. The system exhibits different performances of lanthanum oxide and cerium oxide films by simulations techniques and further it is experimentally checked. The system also versatile having modular interfacing terminals and it would be nice contribution to study most of the chemical sensor films using these simulation techniques.

Keywords: Chemical Sensor films, La_2O_3 , CeO_2 , MATLAB, DAQ and Simulation.

INTRODUCTION:

The material science research for different materials produced lot of data related to different materials like semiconductors, chemical sensors, transducers, resistors, etc. The simulation techniques are supporting its creditability and reliability. In the present work, we are submitting the approach of simulation technique using MATLAB and Data logging techniques ^[1] to produces real time characterizations of deposited lanthanum oxide and cerium oxide films, which are giving moderate competitive results to real time results. Future the scope is available to improve the system by carrying out real time experiments for different chemical sensors.

Math works Corporation for technical computing programming tool developed MATLAB. It is a Matrix Laboratory having script and graphical interface user friendly. These platforms are very helpful to engineers and scientists around the world in design, modeling, simulation, prototype testing, or deployment of new technologies. Scientists mainly use MATLAB for simulations, due to plenty of additional libraries and the Simulink add on. Libraries contain specific higher-level functions of a particular field. Such functions are helpful to speed up the development of advanced applications. The LabVIEW is mostly used ^[2] as a functional and intuitive graphical user interface or interaction with hardware for signal acquisition and generation.

MATLAB is a high-performance language for technical computing. It integrates computation, visualization, and programming in an easy-to-use environment where problems and solutions are express in familiar mathematical notation. Typical uses include:

- Math and computation
- Algorithm development
- Modeling, simulation, and prototyping
- Data analysis, exploration, and visualization

ABSTRACT

Thick films of MoO_3 were prepared by screen printing method on alumina substrate and fired at 600°C in air. Current flowing through the films was measured in air atmosphere at different temperatures. The films were showing decrease in resistance with increase in temperature indicating semiconductor behaviour. The resistivity, activation energy and temperature coefficient of resistance (TCR) are evaluated. The structural behaviour, surface morphology was studied by XRD, SEM and EDAX techniques respectively. From XRD the crystallite size was calculated using Scherer's formula and observed as 19.97nm. From SEM the particle size was observed as 45nm to 156nm. EDAX analysis shows non- stoichiometric behavior of the films. It may be due to the oxygen deficiency in the compound. The resistivity of films was calculated as $82.5 \times 10^4 \Omega\text{m}$. The TCR was evaluated as $0.00997/^\circ\text{C}$. From Arrhenius-type plots, the activation energy was determined. Arrhenius-type plots for the electrical conductivity indicate the presence of at least two different conduction mechanisms. The activation energy at low and high temperature region was observed as 0.109 eV and 0.68 eV respectively.

Keywords: Screen Printing; MoO_3 ; XRD; SEM; Resistivity, TCR

INTRODUCTION

In modern era of electronic equipment, metal–oxide–semiconducting thin films have played a very important role. Transition metal oxides have potential applications as catalysts and sensors. TiO_2 , WO_3 , and MoO_3 are the most popular photochromic and electrochromic materials. [1]

Molybdenum trioxide (MoO_3) is one of the most promising inorganic materials having potential technological application in the fields of large area display devices [2, 3], high density memory devices [4] and optical smart windows [5]. Moreover, it can be used as a potential electro-active material for high energy density secondary lithium batteries [6, 7].

In the present study MoO_3 films were prepared by screen printing method. Screen printing method was employed for film preparation since the method is relatively easy and low cost. [8] Structure and morphology were also studied using XRD and SEM. EDAX analysis was carried out to find out wt. % and atomic % of the elements present in the film. Electrical properties such as resistivity, TCR and activation energy were also studied.

Structural and Electrical Properties of Synthesized Un-doped Iron Oxide Films

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Abstract

In following study we synthesized iron oxide by co-precipitation method. Films of iron oxide were prepared using screen printing method. Films were calcined at 700⁰C. Morphological properties have been studied using XRD technique. XRD confirmed major presence of α -Fe₂O₃ phase of iron oxide and conclusion regarding crystallite size were found out. The size was found to be in range of 50 to 130 nm. Electrical properties of the films were studied with varying temperature. Properties like resistivity, activation energy, temperature coefficient of resistance were studied. Exponential decay in resistance is observed as the temperature of the film increases. From these properties the n-type semiconductor like behavior of the films was observed.

Keywords: Iron Oxide, co-precipitation method, XRD, electrical characteristics, TCR, activation energy.

INTRODUCTION:

Various metal oxides have been studied and it has been found that they possess semiconductor like behavior. In various metal oxides, iron oxide grabs the important place. During the iron oxide formation process various phases of iron oxide have been detected such as α , β and γ . There properties depend upon the process employed for the synthesis of iron oxide. [1]

In this work co-precipitation method was used for iron oxide synthesis. We tried to study morphological properties of iron oxide using XRD. Electrical properties of the film were also calculated. Electrical properties of the films were studied with varying temperature. Properties like resistivity, activation energy, temperature coefficient of resistance were studied. Exponential decay in resistance is observed as the temperature of the film increases. From these properties the n-type semiconductor like behavior of the films was observed.

EXPERIMENTAL WORK:

Materials and Methods:

Iron oxide was prepared using co-precipitation method. All used chemicals were of analytical grade. No further purification was done for chemicals. 10 gm of FeCl₃ 6H₂O was dissolved in 150ml (DDW) water at room temperature with continuous stirring. A 1:1 solution of NH₄OH and H₂O is prepared. This solution was added drop wise in above FeCl₃ solution with continuous stirring. PH of 10 is maintained during the process. A dispersion is formed which was stirred for 1 hr. and then it is heated at about 80⁰C for 2 hrs. A blood red powder is formed which is further calcined at 700⁰ for 4 hrs in furnace. This resulted into a brown powder. Thus prepared powder was finally calcined at 500 °C for 4 hrs. in a furnace.[2]

Film preparation:

Various methods of films preparation are available. Comparatively very affordable, portable and simple method Screen printing method was used for preparation of thick films. Alumina substrate was used for the films. Weight proportion of 70:30 was employed for organic and inorganic materials

Low Temperature Sensing of TiO₂ Thin Films As Ethanol Sensor

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ABSTRACT

In this paper, gas sensing property of a TiO₂ was studied. Nano films of TiO₂ were prepared on glass substrate by spray pyrolysis technique. 0.1 M TiCl₄ was used as precursor for TiO₂ films. These films were fired at 400°C for two hours in air atmosphere. Nano behavior of the films was confirmed by XRD and SEM analysis. From XRD, the crystallite size was measured using Scherer's formula and it was observed as 17.46nm. From SEM, particle size was observed from 75nm to 145nm. Gas sensing behavior of the films was tested in static gas sensing system. Resistance of films was measured by half bridge method. Films were exposed to different gases as LPG, NH₃, NO₂, Ethanol vapour and CO at different ppm concentrations and different operating temperatures. At 50°C (almost room temperature), films of TiO₂ showed good sensing for Ethanol vapours. The gas sensitivity was determined as 59.09% for 1000 ppm of Ethanol vapours. The films showed good response and recovery time.

Keywords: Spray Pyrolysis, TiO₂, XRD, SEM, Ethanol.

INTRODUCTION

It has been always observed that the electrical conductivities of metal oxides vary with composition of gases around them. Therefore there is great attention to metal oxides like SnO₂, ZnO, WO₃, V₂O₅ and TiO₂ as gas sensors [1-12]. Most important parameters of gas sensing materials are their sensitivity, selectivity and stability. There are various methods can be used for developing the films of metal oxides. Deposition methods and its parameters affect the composition, structural, electrical and therefore gas sensing properties of metal oxide films.

The advantage of TiO₂ is that it is highly stable material at high temperature and harsh environment [13]. It can be used as a substrate in catalytic and electrochemical process [11]. Ethanol is alcoholic gas having toxic nature. It is hypnotic (Sleep Producer) gas. Exposure to it increases chance of liver and breast cancer. Therefore sensing and monitoring of ethanol at trace level is highly needed [14].

Spray pyrolysis is a physical method, which is relatively simple, reproducible, size controllable, low cost and continuous for synthesis of some nano metal oxides, mixed metal oxides and metals on metal oxides [15].

In the present study TiO₂ films prepared by spray pyrolysis were investigated for ethanol sensing at almost room temperature.

EXPERIMENTAL WORK

Thin films of TiO₂ were prepared by using 0.1 M TiCl₄ as precursor for TiO₂ films. TiCl₄ was dissolved in 10 ml of ethanol and then mixed in 90 ml double distilled water. The final solution was stirred for 30 minutes. The prepared precursor solution was sprayed on pre heated glass substrate with spray interval of 10 seconds. The temperature of substrate was maintained at 400°C. These films were fired at 400°C for two hours in air atmosphere. Thin films were characterized by XRD and SEM to study the structural properties. The thickness of the grown films were measured by SurfTest SJ 301

Study of Relation Between Particle Size And Magnetic Saturation of Synthesized Undoped Iron Oxide

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Abstract

Nano sized powder of Iron Oxide was prepared using co-precipitation method. Particle size and structure was examined using XRD analysis. Saturation magnetization and other properties were studied using VSM technique. The particles of less than 30 nm size possess low saturation magnetization was confirmed by this study. Result can be attributed to magnetic unisotropy at nano-level.

Keywords: Fe₂O₃, Co-precipitation method, XRD, VSM.

Introduction

Iron Oxide has many application like pigmentation, water purification, drug delivery system etc. It has been a metal oxide of interest since very long period. It is found to work for magnetic purpose also. In the studies for ultrafine ferrite particles like CoFe₂O₄, MnFe₂O₄, it has been found that as particle size reduces below 30 nm the saturation magnetisation reduces drastically [1,2].

Particles size effect was observed in manganese ferrites study. As the particles size decreases the saturation magnetization was found to be decreasing [6]. Ba₂Co₂Fe₂₈O₄₆ nanocrystals synthesized by sol-gel method were found to have grain sizes ranging from 10 to 25 nm. The saturation magnetization was found lower than that of bulk Ba₂Co₂Fe₂₈O₄₆ [7]. Fe₃O₄ nanoparticles were analyzed with average particle sizes from 5 to 150 nm. Saturation magnetization decreased as the average particle size is reduced [8]. Iron-carbon nanocomposite thin films with iron concentrations. Iron-rich nanoparticles of 2-8 nm were obtained. The saturation magnetization was found to decrease compared to the bulk value for pure α -Fe [9]. Co-precipitation method was used to prepare Manganese ferrite, (MnFe₂O₄) fine particles in the size range 5-15 nm. The saturation magnetization again followed decreasing trend with decreasing size [10]. ZnO and ferri-magnetic γ -Fe₂O₃ composites were prepared by powder pressing. The analysis of the hysteretic behavior showed that saturation magnetization of Fe₂O₃ is strongly dependent on particle size [11]. A non-aqueous solvo-thermal method was employed to synthesize Cobalt ferrite, CoFe₂O₄, nanoparticles in the size range 2-15 nm. This study also showed size dependence of saturation magnetization [12].

In our study we tried to test this. The Fe₂O₃ particles were prepared by co-precipitation method. The particle size was confirmed using XRD analysis. Magnetic properties of the Fe₂O₃ particles were studied using VSM technique. Average particle size was found to be 5nm. Saturation magnetization was very low 1 emu/gm. Results drawn for ferrites [1,2,6,7,10] and nanoparticles prepared by various method [8,9,11] were also found true for nano-Fe₂O₃ particles prepared by co-precipitation method.

Electrical Characterization of Undoped and Cu Doped ZnO Thin Films Using Physical Vapor Deposition Technique

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ABSTRACT

Undoped ZnO and Cu doped ZnO thin films were prepared by physical vapor deposition technique on alumina substrate and annealed at different temperatures. The temperature dependent electrical resistance was measured by half bridge method in air atmosphere. The temperature and voltage dependent current was measured for the same films. The increase of resistance with reciprocal temperature for both undoped and doped ZnO thin films show constant difference at higher temperature side, but at lower temperatures the metallic doping of Cu in ZnO shows more conductivity than undoped ZnO due to excess current carriers. The I-V Characteristics are almost linear for both undoped and doped ZnO with constant shift.

Keywords: ZnO, thin films, alumina substrate, temperature, TCR, current, voltage.

INTRODUCTION:

Zinc oxide is a wide direct band gap (3.37 eV) semiconductor with a large excitation binding energy (60 meV), has received much attention due to its potential applications in the optoelectronic field [1–3]. One-dimensional ZnO nanostructures such as nanowires have been extensively studied for other applications including chemical sensors [4], solar cells [5], blue and ultraviolet (UV) light-emitting diodes [6]. Many techniques have been successfully used to synthesize ZnO thin films, including sol-gel [7], pulsed laser deposition (PLD) [8], thermal evaporation [9], chemical vapor deposition (CVD) [10] etc. Another method to prepare ZnO thin films is thermal oxidation of metallic Zn thin films [11] reported the production of high quality ZnO films by thermal oxidation of metallic Zn. Pure and qualified ZnO films have been prepared by thermal oxidation of metallic Zinc films in air [12,13]. Tae-Won Kim *et al.* have grown ZnO nanowires with an average diameter of 20 nm by thermal oxidation of pre-deposited hexagonal Zn nanoplates on a CaF₂ (111) substrate [14].

In this paper, the pure ZnO and Cu doped ZnO thin films were prepared on alumina substrates by physical vapor deposition technique. The films were annealed at different temperatures and electrical characterization was predicted.

EXPERIMENTAL TECHNIQUE:

Substrate Cleaning

The alumina substrates were cleaned using liquid detergent, then they kept in potassium dichromate and HCL solution. After this, they were cleaned using distilled water and agitated ultrasonically in acetone. Then the substrates were dried under IR lamp.

Preparation of ZnO thin films

Pure ZnO and Cu doped ZnO thin films were deposited onto the alumina substrates by physical vapor deposition technique. The substrates were cleaned and mounted onto the stand placed nearly 10 cm above the tungsten filament. The material to be deposited was placed in tungsten basket. In this method, the metal Zinc and Copper material

Structural Properties of Vacuum Evaporated Zn-Te Thin Films as a Function of Annealing Temperature.

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ABSTRACT

Thin films of Zn-Te compound of varying compositions and thicknesses have been deposited on glass substrates employing three temperature methods. Siemens Diffraktometer D-5000 Kristalloflex model using CuK α radiations with wavelength of 1.5443 Å was used for X-ray diffraction of Zn-Te thin films. The effect of annealing temperature on Zn-Te films were studied by recording diffractograms of these films. These diffractograms were used to find out the average grain size and crystal structure of Zn-Te thin films. The average particle size, specific surface area of Zn-Te thin films was calculated from SEM of such films. It was observed that, the increased annealing temperature changes particle size from spherical shape to cylindrical nano roads.

Keywords: Zn-Te, thin films, annealing temperature, grain size, SEM, XRD.

INTRODUCTION:

Zinc telluride (ZnTe), as a direct semiconductor with a band gap of 2.28 eV at T=300 K, is an important component of the II-VI family and an attractive material for various optoelectronic devices, such as green LEDs and photovoltaic cells [1, 2]. Vecht [3] has reviewed several methods for the recrystallization of films of II-VI compounds for the enhancement of crystallite size and the improvement of electrical properties.

Pal et. al [4] reported that thin films of ZnTe of different thicknesses were deposited on glass substrate in a vacuum of 10⁻⁴ torr. The composition of Zn and Te varied with thickness of the films. Thickness was measured by interference. The X-ray diffraction pattern was recorded by a Norelco X-ray diffractometer. For ZnTe un doped films of different thicknesses, both the direct and indirect band gaps decreased with the increase of thickness and hence particle size. Pal et. al [5] studied the X-ray diffraction, transmission electron microscopy and transmission electron diffraction on ZnTe thin films deposited on glass substrates. The variations were studied on different structural parameters like crystalline size, r-m-s strain, dislocation density and stacking fault probability with thickness of the films as well as with substrate temperature. Maximum crystalline size and minimum dislocation density were observed corresponding to substrate temperature of 573 K. The hexagonal phase was observed along with predominant cubic phase at substrate temperature beyond 623 K. Tupenevich and Kononenko [6] presented the data on the spectral photosensitivity of metal semiconductor diodes based on ZnTe and the height of the diffusion potential barrier. Evidence was found that, at thermodynamic equilibrium, these states were filled by electrons and provided a negative surface charge.

Potlog et. al [7] Structural investigations performed by X-ray diffraction technique showed that studied samples are polycrystalline and have a cubic (zinc blende) structure. XRD patterns have been used to determine the microstructural parameters (crystallite size, lattice parameter) of investigated films. Surface morphology studies SEM shows that the grains are uniformly distributed over the entire surface of the substrate. Optical properties of ZnTe films were studied extensively in the range of incident photon energy (0.5-4.0) eV. In the studied ZnTe films the direct transitions take place. Hsu et. al [8] recorded the structure properties of the ZnTe thin films using a Rigaku X-ray diffractometer with Cu K α 1/40kV/40mA radiation source (λ =1.54056 Å), Ni filter. The X-ray diffraction (XRD) analysis was performed using Rigaku software PDXL.

Electrical Resistivity of Vacuum Evaporated AgSe Thin Films as a Function of Thickness

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ABSTRACT

Thin films of AgSe compound of varying thicknesses have been deposited on glass substrates employing three temperature methods, in a vacuum of the order of 10^{-5} torr. The electrical resistivity of the films has been studied as a function of thickness and annealing temperature. The activation energy has been calculated as a function of thickness and annealing temperature of AgSe thin films. It is found that activation energy increases with increase of thickness and annealing temperature.

KEYWORDS: AgSe, thin films, thickness, activation energy, resistivity.

INTRODUCTION

Electrical resistivity of vacuum-deposited and vacuum-annealed β -Ag₂Se thin films of thicknesses between 600 and 2000 Å has been measured in vacuum [1]. It is found that all the films exhibit semiconducting behavior and the energy band gap is a function of thickness increasing linearly with it. It is also found that the film resistivity and temperature coefficient of resistivity (TCR) are both functions of inverse thickness as expected from the thin-film size-effect theories. The linear dependence of band gap on thickness is thought to be due to the large density of dislocations in thin films and its variation with thickness and the changing stoichiometry of the films. The reciprocal thickness dependence of resistivity and TCR was explained by the effective mean-free-path models. The mean free path (l_g) estimated from this model turns out to about 1300 Å and the value estimated from the ρ plot agrees well with that estimated from the β plot. Also, carrier concentration in the films was estimated to be about $6 \times 10^{18} \text{ cm}^{-3}$. Thin films of silver selenide (Ag₂Se) between thicknesses of about 700 and 2200 Å [2] have been prepared on glass substrates at room temperature in a vacuum of 5×10^{-5} torr. After vacuum annealing the films (at about 373 K for 3 h) electrical resistivity measurements on these films have been carried out in vacuum. Electrical resistivity [3] of vacuum evaporated thin layers of Ag-Se has been studied in the temperature range 298 K to 523 K. Films of Ag_xSe_{1-x} ($0 < x < 0.7$) show semiconducting to metallic and metallic to semiconducting transformation during heating and cooling respectively. The linear dependence of energy of activation on thickness of these films is attributed to the large density of dislocations and non-stoichiometry of these films.

The study of electrical properties of β -Ag₂Te and β -Ag₂Se [4] has been extended to 4.2 K. The former compound was zone refined without decomposition. Both n -type and p -type samples of β -Ag₂Te were studied; all samples of β -Ag₂Se prepared were n type to 4.2 K. Neither semiconductor showed any indication of extrinsic carrier freeze-out or of impurity banding. The transmission electron microscopy [5] studies show Ag₂Se nanowires can be high conducting

The Photoconductivity of Ag-Te Thin Films as a Function of Thickness and Composition at Room Temperature

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ABSTRACT

Thin films of Ag-Te compound of various thicknesses at different compositions have been formed on glass substrates employing three temperature method. The photoconductivity study was made at dark and illuminated conditions. The spectral response of photocurrent as a function of certain wavelength of incident radiations. The maximum photocurrent was developed at about 570 nm irrespective of thickness. For different compositions of Ag and Te, the photocurrent was a function of applied bias voltage, incident light intensity and decay time irrespective of thickness of the film at room temperature.

Keywords: Ag-Te, photoconductivity, light intensity, thickness, composition.

INTRODUCTION

Silver-Telluride is a I-VI narrow band gap compound semiconductor. Electrical resistance measurement of Ag₂Te thin films for different thicknesses on clean glass substrates held at room temperature in a vacuum of 5×10^{-5} torr have been carried out from about 300 to 450 K. A semiconducting to metallic phase transition takes place during heating. The phase transition temperature is also the function of thickness [1]. Damodara das and Karunakaran [2] reported electrical conductivity and thermoelectric power measurements as a function of temperature have been carried out on Ag₂Te thin films of different thicknesses on glass substrates at room temperature in a vacuum. It is found that the phase transition temperatures located by steep change in resistance and thermoelectric power with temperature during heating and cooling are different, there by showing a thermal hysteresis during the phase transition, the magnitude of hysteresis as a function of thickness. The electrical and structural properties of silver telluride films have been investigated by several workers in stoichiometric phase, as a function of temperature in bulk as well as thin film form.

The sensitivity of the Ag- photodoping process [3] has been measured as a function of photon energy between 1.9 and 6.4 eV. The sensitivity increases with increasing photon energy except at 3.8 eV (325 nm) where Ag exhibits an anomalous window. At this energy there is an abrupt and large decrease of sensitivity. In a second measurement, the transmission as a function of wavelength between 200 and 900 nm of a 2000 Å thick film of As₂S₃ doped with an imaging dose of Ag and a second sample doped with a larger than imaging dose are compared with an undoped sample. Band-gap shrinkage is different for the two doses. Both measurements suggest that under certain conditions, photon absorption in the Ag-photodoping process occurs in the Ag the photodoping of amorphous chalcogenides [4] by metals, and in particular by silver. The kinetics of the photodissolution of the metal are described as also is the influence on the photodissolution rate of such factors as the wavelength and intensity of light, the composition and temperature of the semiconductor, and an external electric field. A separate section describes lateral diffusion. The study of electrical properties of β -Ag₂Te and β -Ag₂Se [5] has been extended to 4.2 K. The former compound was zone refined without decomposition. Both *n*- and *p*-type samples of β -Ag₂Te were



Thickness Dependent Thermoelectric Power (α) of Ag-Te Thin Films

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ABSTRACT

Thin films of Ag-Te compound of varying thicknesses at fixed composition have been formed on glass substrates in a vacuum of the order of 10^{-5} torr. The films were annealed at constant temperature for 6 to 8 h and then thermoelectric power (α) of annealed films has been evaluated. The thermoelectric power shows composition dependent p-type and n-type behavior. The measurements were carried out with constant temperature difference of 2 K and 10 K employing three temperature methods for low and high temperature regions respectively. Thermoelectric power (α) for both p-type and n-type materials increase with film thickness.

Keywords: Ag-Te, Glass substrate, Thin films, Thickness, Thermoelectric power

INTRODUCTION

Studies on the I-VI semiconducting compounds have received much attention because of their potential applications in semiconductor technology. The compound Ag_2Te is a narrow band gap semiconductor with high electron mobility and low lattice thermal conductivity, It exists in two modifications; a low temperature monoclinic modification and at high temperature cubic modification [1]. The Das and Karunakaran [2] reported electrical conductivity and thermoelectric power measurements as a function of temperature have been carried out on Ag_2Te thin films of different thicknesses on glass substrates at room temperature in a vacuum. It is found that the phase transition temperatures located by steep change in resistance and thermoelectric power with temperature during heating and cooling are different, there by showing a thermal hysteresis during the phase transition, the magnitude of hysteresis as a function of thickness.

The level of interest in thermo magnetic and magneto thermoelectric transducers has increased greatly in recent years. The reason for this trend is that in certain cases, these devices have advantages over thermoelectric transducers, in particular solid state cooling devices and IR radiation pickups [3,4].

The electrical and structural properties of silver telluride films have been investigated by several workers in stoichiometric phase, as a function of temperature. However these compounds are less investigated in the form of thin films of different composition and thicknesses. From this point of view and considering application in electronic devices the effect of thickness and composition of Ag-Te films are discussed. We report the measurement of thickness dependent thermoelectric power for various compositions of Ag-Te thin films.

MATERIALS AND METHODS

Preparation of tin thin films

Thin films of Ag-Te for the measurement of thermoelectric power were prepared by three temperature method [5-11] for various thicknesses. The constituent elements of Ag (99.999% pure) and Te (99.99% pure) used for thin films preparation in metal and powder form respectively. They were evaporated from two different preheated conical mica baskets which in turn heated externally by nichrome wire. The films were prepared on glass substrate kept at room temperature in a vacuum of the order of 10^{-5} torr with an IBP TORR-120 vacuum unit. After adjusting the flux rates from two sources by varying the source current, films of varying thicknesses were obtained by overcoming the

Thickness Dependent Temperature Coefficient of Resistance (T.C.R) for various Ag-Te thin films.

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Abstract: Thin films of Ag-Te compound of varying thicknesses have been deposited on glass substrate employing three temperature method. The temperature coefficient of resistance (TCR) was studied as a function of thickness for Ag-Te thin films at [Ag] > 50 at. wt. % and < 50 at. wt. %. The temperature dependent phase change from semiconducting to metallic for the composition of [Ag] > 50 at. wt. % in Ag-Te thin films. The T.C.R. is negative for semiconducting Ag-Te films with [Ag] < 54 at. wt. %, irrespective of thickness and temperature. For [Ag] > 54 at. wt. % is negative in low temperature region ($T < 413$ K) and positive in high temperature region ($T > 413$ K).

Keywords: Ag-Te, substrate, thin films, thickness, temperature, TCR.

Date of Submission: 25-09-2017

Date of acceptance: 07-10-2017

I. Introduction

The phase transition temperatures, as observed during the above semiconductor to metal transition of Ag₂Te reported [1]. The electrical and structural properties of silver telluride films having stoichiometric composition have been measured as a function of temperature [2, 3]. Sharma [4] has studied in detail the structural transformations in Ag₂Te thin films by electron diffraction technique. These studies indicated that transformation temperatures during heating and cooling were 430 and 388 K respectively in case of Ag₂Te thin films. The X-ray diffraction carried out by Mamedov et al [5] for the synthesis of bulk samples of Ag₂Te revealed that the transition takes place during heating at 420 K and during cooling at 411 K.

So, I report the temperature dependent phase transition from semiconducting to metallic with [Ag] > 50 at. wt. % in Ag-Te thin films and the thickness dependent TCR was calculated.

II. Materials and Methods

The Ag-Te thin films of different thicknesses for 'Ag' > 50 at. wt. % and < 50 at. wt. % were prepared by vacuum deposition technique of the constituent elements 'Ag' (99.999% pure) and 'Te' (99.99% pure) by three temperature method [6-10]. Silver metal and tellurium powder were evaporated from two different preheated conical mica baskets which in turn heated externally by nichrome wire. The films were prepared on glass substrate kept at room temperature in a vacuum of the order of 10^{-5} torr.

The films obtained were annealed at ~ 423 K upto 8 hours for the purpose of uniform distribution of components of the deposits. The films thickness (d) was measured by gravimetric method as reported earlier [8-10]. The composition of 'Ag' in Ag-Te films was determined by employing absorption spectroscopy [11] at 620 nm.

III. Results and discussion

The temperature coefficient of resistance (T.C.R.) of Ag-Te thin films at different temperatures, from the resistance versus temperature graph was calculated by using the relation

$$T.C.R. = (1/R) (\Delta R / \Delta T), K^{-1} \text{ -----(1)}$$

It is found that the T.C.R. is negative for semiconducting Ag-Te thin films with [Ag] < 54 at. wt. %, irrespective of thickness and temperature. For [Ag] > 54 at. wt. % is negative in low temperature region ($T < 413$ K) and positive in high temperature region ($T > 413$ K).

Composition dependent thermoelectric Power (α) of Ag-Te thin films as a function of temperature and thickness.

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Abstract: Silver–Tellurium thin films of varying compositions and of fixed thicknesses have been formed on glass substrates in a vacuum of the order of 10^{-5} torr. The films were annealed at constant temperature for 6 to 8 hours, after annealing the temperature dependent thermoelectric power (α) of the films has been evaluated. The phase change of Ag-Te thin films was found to be composition dependent at room temperature and independent on thickness. The thermoelectric power (α) for both p-type and n-type materials for a fixed thickness have been carried out with a constant temperature difference of 10^0 K employing three temperature method.

Keywords: Ag-Te, glass substrate, thin films, composition, thermoelectric power, temperature.

Date of Submission: 11-09-2017

Date of acceptance: 20-09-2017

I. INTRODUCTION

The Silver–Telluride is a I-VI narrow band gap compound semiconductor. The phase transition temperatures as observed during the above semiconductor to metal transition of Ag_2Te reported [1]. The electrical and structural properties of silver telluride stoichiometric films have been measured as a function of temperature [2]. Aliev and Nikulin [3] have studied the thermoelectric power of silver telluride in the low temperature ranges from 2^0K to 90^0K in order to study the drag effect on carriers in silver telluride. Thermoelectric power of silver telluride increases with increasing temperature from 300^0K to 415^0K confirming the degeneracy of carriers [4]. Silver telluride exhibits p-type semiconducting behavior [5,6].

A number of materials are known which show a phase transition at a relatively low temperature. Ag_2Te has a phase transformation at 423^0K . The phase transformation with increasing temperature was characterized by decrease in both the density of free carriers and their mobility, with resultant large decrease in dark conductivity [7,8]. The phase transformation in Ag_2Te corresponds to an increase in the band gap from 0.67 eV in the low temperature region to 0.98 eV in high temperature region.

However these compounds are less investigated in the form of thin films of different compositions. From this point of view, I report the measurement of temperature and composition dependent thermoelectric power for different thicknesses.

II. EXPERIMENTAL DETAILS

Thin films of Ag-Te for the measurement of thermoelectric power were prepared by the three temperature method [9-14]. Ag-Te films of different compositions and different thicknesses were prepared by vacuum deposition of the constituent elements Ag (99.999% pure) and Te (99.99% pure). Silver metal and tellurium powder were evaporated from two different preheated conical mica baskets which in turn heated externally by nichrome wire. The films were prepared on glass substrate kept at room temperature in a vacuum of the order of 10^{-5} torr. The films obtained were annealed at $\sim 423^0\text{K}$ for 6 to 8 hours for the purpose of uniform distribution of the components of the deposits. The method employed to determine the composition of the film were similar to those reported earlier [11-13]. The composition of Ag from Ag-Te films was determined by employing absorption spectroscopy [15] at 350 nm.

The film thickness (d) was measured by multiple beam interferometry [16] and gravimetric method [11-14] using the relation,

$$d = \frac{M}{g \times A} \text{ cm}$$

Effect of potassium iodide on solubility and density of Copper iodide in water and DMF at various temperatures.

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Abstract

The solubility of Copper iodide (CuI) in water and dimethyl formamide (DMF) with potassium iodide in the combination as KI + Water, and KI + DMF were measured using an analytical gravimetric method at temperatures ranging from (298.15 to 315.15) K. The densities of the saturated solutions for both combinations are also reported. The results are interpreted in the form of enthalpy change ΔH .

Keywords: Copper iodide, Mole fraction solubility, density, potassium iodide, molar enthalpy, molar entropy, Gibbs energy.

1. INTRODUCTION

CuI is used as a reagent in organic synthesis. In combination with 1,2- or 1,3 diamine ligands, CuI catalyzes the conversion of aryl, heteroaryl, and vinyl bromides into the corresponding iodides [1]. Solubility studies of electrolytes have applications in diverse fields such as the pharmaceutical industry, agriculture, biology, medicine, etc [2]. Solubility data for many inorganic salts in aqueous systems are available [3-5]. However there is no data available for solubility of copper iodide in presence of potassium iodide as additive. Therefore we have undertaken measurements of solubility and densities of copper iodide in presence of potassium iodide at various percentage of KI in Water and DMF at various temperatures. The thermodynamic functions of solution of CuI were calculated by using Van't Hoff equation.

2. MATERIALS AND METHODS

An excess amount of CuI was added to the KI binary solvents mixtures prepared by weight (Shimadzu, Auxzzo) with an uncertainty of ± 0.1 mg, in a specially designed 100 mL double jacketed flask. Water was circulated at constant temperature between the outer and inner walls of the flask. The temperature of the circulating water was controlled by thermostat to within (± 0.1) K. The solution was continuously stirred using a magnetic stirrer for long time (about 1 h) so that equilibrium is assured, no further solute dissolved, and the temperature of solution is same as that of circulating water; the stirrer was switched off; and the solution was allowed to stand for 1 h. Then a fixed quantity of the supernatant liquid was withdrawn from the flask in a weighing bottle with the help of pipet which is hotter than the solution. The weight of

Solubility and Density of Silver Iodide in Water and DMF at Various Temperatures as Function of Potassium Iodide.

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Abstract: The solubility of silver iodide (AgI) in water, dimethyl formamide (DMF), KI + Water, and KI + DMF were measured using an analytical gravimetric method at temperatures ranging from (298.15 to 315.15) K. The densities of the saturated solutions are also reported. The results are interpreted in the form of enthalpy change ΔH .

Keywords: Silver iodide, solubility, density, potassium iodide, molar enthalpy, molar entropy, Gibbs energy.

I. Introduction

AgI used for cloud seeding [1]. Solubility studies of electrolytes have applications in diverse fields such as the pharmaceutical industry, agriculture, biology, medicine, etc [2]. Solubility data for many inorganic salts in aqueous systems are available [3-5]. However there is no data available for solubility of silver iodide in presence of potassium iodide as additive. Therefore we have undertaken measurements of solubility and densities of silver iodide in presence of potassium iodide at various percentage of KI in Water and DMF at various temperatures. The thermodynamic functions of solution of AgI were calculated by using Van't Hoff equation.

II. Materials And Methods

The apparatus and procedures used for solubility and density measurement have been described earlier [6-8]. An excess amount of AgI was added to the KI binary solvents mixtures prepared by weight (Shimadzu, Auxzzo) with an uncertainty of ± 0.1 mg, in a specially designed 100 mL double jacketed flask. Water was circulated at constant temperature between the outer and inner walls of the flask. The temperature of the circulating water was controlled by thermostat to within (± 0.1) K. The solution was continuously stirred using a magnetic stirrer for long time (about 1 h) so that equilibrium is assured, no further solute dissolved, and the temperature of solution is same as that of circulating water; the stirrer was switched off; and the solution was allowed to stand for 1 h. Then a fixed quantity of the supernatant liquid was withdrawn from the flask in a weighing bottle with the help of pipet which is hotter than the solution. The weight of this sample was taken and the sample was kept in an oven at 343 K until the whole solvent was evaporated and the residue was completely dry. This was confirmed by weighing two or three times until a constant weight was obtained after keeping the sample in an oven for another 30 min every time. The solubility has been calculated using weight of solute and weight of solution. The saturated mole fraction solubility was calculated using usual equations. Densities were determined using a 15 cm³ bicapillary pycnometer. For calibration of pycnometer triply distilled and degassed water with a density of 0.99705 g·cm⁻³ at 298.15 K was used. The pycnometer filled with air bubble free experimental liquids was kept in a transparent walled thermostat (maintained at constant temperature ± 0.1 K) for (10 to 15) min to attain thermal equilibrium. The heights of the liquid levels in the two arms were measured with the help of a traveling microscope, which could read to 0.01 mm.

III. Figures And Tables

Table 1: Mole fraction solubility (X) of AgI in KI + Water and KI + DMF solvent.

AgI+KI-Water					
Temp (°K)	1% KI	2% KI	3% KI	4% KI	5% KI
298.15	1.68E-05	2.69E-05	9.44E-05	0.00019	0.00029
303.15	6.61E-05	6.69E-05	0.00011	0.00017	0.00025
308.15	0.00010	8.00E-05	0.00014	0.00023	0.00028
315.15	2.30E-04	6.21E-05	0.00016	0.00022	0.00030
AgI+KI-DMF					
Temp (°K)	0.1% KI	0.2% KI	0.3% KI	0.4 KI	0.5% KI
298.15	0.0009	0.00234	0.00264	0.00335	0.00290
303.15	0.0010	0.00237	0.00326	0.00372	0.00353
308.15	0.0011	0.00234	0.00354	0.00388	0.00548
315.15	0.0011	0.00257	0.00352	0.00398	0.00643

Composition Dependent Thermoelectric Power (α) of Zn-Te Thin Films as a Function of Temperature and Thickness.

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Abstract:- Thin films of Zn-Te compound of varying thicknesses for different compositions have been deposited on glass substrates in a vacuum of the order of 10^{-5} torr. The composite films used for characterization were annealed at a constant temperature for 6 to 8 hours. Thermo-electric power (α) has been evaluated as a function of thickness, composition and temperature of films. The Zn-Te thin films showed three distinct mechanisms. They show n-type behavior in the temperature range of 273 to 289 $^{\circ}\text{K}$ and p-type behavior in the temperature range of 289 to 433 $^{\circ}\text{K}$. Thermoelectric power slowly increases with thickness of the Zn-Te films. The maximum thermoelectric power observed nearly at 50 at.wt.% of Zn in Zn-Te thin films can be attributed to defect free stoichiometric phase.

Keywords-- Zn-Te, thin films, thickness, composition, transition temperature, thermoelectric power (α)

I. INTRODUCTION

Thin films of Zn-Te have been made by several workers from the point of view of crystallization [1-3] and application considerations [4-5]. The Zn-Te is a II-VI semiconducting compound of a direct band gap 2.26 eV at room temperature. The polycrystalline compound semiconductor films are of considerable technological importance and play a major role in the fabrication of electronic devices, both from purely scientific and application points of view, it is used in detectors, IR filters, Solar cells, Switching devices, etc. The crystallite size in evaporated films can be improved by employing a higher deposition temperature for the reduction of cracking and pinhole effects [6].

Thermoelectric power of Zn-Te crystals were studied by Davis-Mott model [7]. Many amorphous materials [8-9] when heated to a relatively high temperature undergo an irreversible change in structure. Thermal energy becomes large enough to initiate a very fast crystallization process and amorphous materials switch to a polycrystalline state.

Seebeck coefficient measurements over entire composition range of Zn-Te films are made using differential method [10-14]. The temperature of hot end (T_H) is varied from 273 to 433 $^{\circ}\text{K}$ with constant difference of 2 $^{\circ}\text{K}$ and 10 $^{\circ}\text{K}$ for temperature regions of 273 to 303 $^{\circ}\text{K}$ and 303 to 433 $^{\circ}\text{K}$ respectively.

The TEP (α) is found negative in sign when the temperature of hot end varied from 273 to 289 $^{\circ}\text{K}$, however it is positive in sign for a temperature range of 289 to 433 $^{\circ}\text{K}$. The change of sign of TEP (α) from negative to positive is composition dependent. For stoichiometric ZnTe (Zn ~ 50 at. wt. %) films, ' α ' changes its sign negative to positive at 289 $^{\circ}\text{K}$, and for films with Zn < 50 at wt %, and Zn > 50 at. wt %, the transition temperature changes by $\sim \pm 2^{\circ}\text{K}$. This fact reveals that Zn-Te deposits are n-type in the temperature range of 273 to 289 $^{\circ}\text{K}$ and p-type in the temperature range of 289 to 433 $^{\circ}\text{K}$. It seems that in Zn-Te deposits the majority carriers are p-type.

II. EXPERIMENTAL

The work reported here Zn-Te thin films were prepared by the three temperature method [13,14,17,18]. Zn-Te films of different compositions and different thickness were prepared by vacuum deposition of the constituent elements Zn (99.99% pure) and Te (99.99% pure). Zinc and Tellurium powders were evaporated from two different pre-heated conical mica baskets which in turn were heated externally by nichrome wire. The films were prepared mostly on glass substrate kept at room temperature in a vacuum of the order of 10^{-5} torr, after adjusting the flux rates from two sources by varying the source current, films of varying compositions were obtained. Overcoming the experimental difficulties in adjusting and maintaining evaporation rates of the individual components to obtain films of different compositions having nearly same thickness and films of different thicknesses with same composition. The films obtained were annealed at $\sim 433^{\circ}\text{K}$ for 6 to 8 hours for the purpose of uniform distribution of the components in the deposits. The method employed to determine the composition, thickness and uniformity of the film were similar to those reported earlier [13,14,17-19]. The composition of the film was determined by employing absorption spectroscopy [15] at a wavelength of 350 m μ with an accuracy of ± 1 at.wt.%.

Preparation and Characterization of ZnO Nanoparticles by Chemical Route Method

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ABSTRACT

Zinc oxide nanoparticles have been developed using hexahydrated zinc nitrate by chemical route method. The white precipitate was obtained at 800C by a simple wet chemical route. Zinc oxide nanoparticles based thick film samples were prepared by standard screen printing technique and fired at 5000C for 30 minutes. The obtained ZnO nanoparticles thick films were investigated by X-ray diffraction (crystal Structural), X-ray diffraction patterns showed that ZnO nanoparticles have hexagonalwurtzite structure. The UV-VIS absorption spectra of ZnO nanoparticles sintered at 4000C shows a maximum absorption band at 259 nm. The FT-IR shows the absorption peak of ZnO nanoparticles are observed in the range 600-450 per cm is attributed to the stretching Zn-O bonds respectively. No hydrogen bonding was observed in the commercial ZnOwhereas in ZnO nanoparticles hydrogen bonding was observed at 3414 per cm.Using half bridge method the D.C resistance of the film samples measured in air atmosphere at different temperatures. The TCR, activation energy and activation energy of films were evaluated at 5000C.

Keywords: ZnO, Material behavior, UV-vis analysis, FTIR, TCR, activation energ.

INTRODUCTION:

Research in the field of synthesis methodology of nano-materials is only oriented controlling in their Size, shape and different composition. In recent times nano-material technology has been useful in reducing the size of the materials to nano-scale [1]. Nanosized semiconductors are in demand due to their significant electrical, chemical, optical, magnetic and gas sensing properties which are useful in electronic devices with various functions [2-4]. Zinc oxide has hexagonal wurtzite unit cell structure a band gap (3.37eV) with its lattice parameters $a = 3.253 \text{ \AA}$ and $c = 5.209 \text{ \AA}$ with large binding energy [2,5,6]. The physical and chemical properties of nanoparticle materials depends on size, size dispersity, shape, surface state, crystal structure, organization onto a hold up and dispensability[7]. Zinc oxide is one of the most studied materials in nanotechnology that have been studied for applications such as Solar cells, Gas sensors, Photo luminescent , Photo detectors, Photo catalysis, electrical devise, acoustic devises, optoelectronics, nano-generators, biosensors [8-13], the ability to absorbance in the UV range and negligible toxicity makes zinc oxide nanoparticles very useful for sensing and optical study [14-17]. Numbers of research workers have reported that the size and shape of the material strongly affect the properties and the applications of the nano-materials. Reducing the size of the ZnO to the nano-scale changes its properties significantly [18-21]. Hence, more effort is being dedicated on controlling the size and shape of the nanoparticles; however even to this time remains a challenge in symmetric chemists in the nanotechnology and nano-science field. Different factors such as concentration, precursors, capping molecule, solvents, time, temperature and others are reported to affect the size and shape of the nanoparticles [22, 23] .The synthesis of ZnO nano-paricles may be achieved by physical and chemical route methods. Several numbers of methods for preparation of zinc oxide nanoparticles are reported in literature survey, such as sol-gel, hydrothermal, solution combustion, micro emulsion, microwave irradiation, solvo thermal and co-precipitation chemical route [24, 25]. However, chemical route methods are more suitable for production of high quality zinc oxide nanoparticles in industrial scale [24] due to its simplicity, less expensive, low cost and efficiency in obtaining nanoparticles with uniform particle size and surface morphology [25]. This

A Review on Graphene & its Derivatives for Gas Sensors

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Abstract:

This review summarizes the present scenario and research on Graphene and its derivative based gas sensors and its application as gas sensors. Graphene-based gas sensors have attracted much attention in recent years due to their variety of structures, unique sensing performances, room-temperature working conditions, and tremendous application prospects, etc. Graphene-like properties make reduced graphene oxide a highly desirable material to be used in gas sensor, biological, environmental or catalytic applications as well as optoelectronic and storage devices.

In this article, we summarize firstly the basics of gas sensors, various sensing material, need and properties of graphene, various synthesis methods of graphene based materials. Structure of gas sensors and review on application of graphene and its derivatives as gas sensor. The review provides important reference for follow-up research work for the future.

Keywords: Pollution, Gas sensors, Graphene, Reduced Graphene Oxide (rGO), Sensitivity.

I. INTRODUCTION

Modern industrialized society has brought a series of problems to our world. Many industrial and commercial activities makes it necessary to constantly monitor and control pollution in the environment, chemical factories, and food processing plants, laboratories, homes, hospitals, and technical installations in general, with applications ranging from domestic gas alarms and medical diagnostic apparatus to safety, environmental and chemical plant instrumentation.

Nowadays, Gas sensor technology has played an important role in various fields such as in the automation of industrial processes, in the emission control for automobiles, and in gas leakage detection in the home and workplace, and so on. Without sensors, significant advances in control and instrumentation will not be possible.

Nitrogen and oxygen are main components of air out of a mixture of several gases. Other components of air usually showing small concentrations are argon, other inert gases, carbon dioxide and hydrogen. The composition of air is constantly varying due to the interchange of atoms and molecules between air and the surrounding bodies and also, because of the diffusion and interaction of the particles in the gas phase. This makes atmosphere a fully open system, spatially in-homogeneous and with rich internal dynamics. Some other constituents usually sensed in changing concentrations are ozone, carbon monoxide, sulphur or nitrogen oxides and several VOC compounds. Also important is noting that very small solid (smoke, dust) or liquid particles (the clouds, the fog) can be carried in suspension by air.

Also, Hydrocarbon gases, including liquid petroleum gas (LPG) find useful applications, as a clean source of energy at both fuels for domestic and industrial purposes [1]. Major constituents of LPG include butane-(C₄H₁₀) (70%-80%), propane-(C₃H₈) (5%-10%) and propylene-(C₃H₆), butylenes-(C₄H₈), ethylene and methane (1%-5%). They are not pure chemical hydrocarbons, but commercial quality products marketed as butane and propane, which also contain trace quantities of other similar gases. But they are potentially hazardous and combustible gases which might cause explosion if any leaks of these gases occur accidentally or by mistakes.

Gases are the key targets in many industrial and domestic activities requiring improved level of measurement or control. This has been stimulated by a series of clean air laws [2], which have or are being legislated on the international, national, state and local levels.

At present, gaseous pollution is mainly caused by rapid industrialization which increasingly involves the use and manufacture of highly dangerous substances. Particularly nitrogen oxides and other gases toxic and combustible gases are released in large amounts to the environment from combustion sources and automobiles. Inevitably, occasional escapes of gas occur which leads to environmental imbalance and global

Preparation and Characterization of Tungsten Oxide Thick Film Gas Sensor

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Abstract: Tungsten oxide (WO_3) thick films are prepared by screen printing method for detection of pollutant gases. WO_3 thick films characteristics was investigated for X-ray diffraction to determine the structure and phases. The X-ray diffraction patterns indicate that the thick films fired at 600, 700 and 800°C are polycrystalline. Surface morphological and compositional characterizations of the prepared pure WO_3 thick films were determined using SEM with EDAX. The temperature dependent electrical resistance variations for pure WO_3 thick films were investigated. The electrical resistivity, TCR, activation energy of pure WO_3 thick films was obtained. WO_3 thick film Sensor response is investigated for various gases for different concentrations. It is found that tungsten oxide based thick film sensor is a good candidate for NO_2 sensors with satisfactory response and recovery times. The sensing mechanism associated with NO_2 gas detection is also discussed. The prepared sensor is characterized by XRD and SEM.,

Keywords - Tungsten trioxide, thick film sensor, resistivity, TCR, SEM and XRD, sensitivity

Date of Submission: 21-06-2018

Date of acceptance: 09-07-2018

I. Introduction

Tungsten trioxide is inorganic chemical compound containing oxygen and the transition metal tungsten. It is obtained as an intermediate in the recovery of tungsten from its minerals. Tungsten ores are treated with alkalis to produce WO_3 . It possesses a polycrystalline structure. Semiconducting metal oxides has proved to be very prominent member for detecting and monitoring the emission of pollutant gases. Their sensing principle is based on the change in the resistance of a semiconductor metal oxide film when specific gases interact with its surface. The surface of the semiconductor provides different surface states and when gas molecules are adsorbed and react at the semiconductor surface a change in the inter-grain barrier height occurs. So, the basic principle of operation of a semiconductor gas sensor is the control of surface potential barrier by adsorbent. Tungsten oxide films are n-type semiconductors with a band gap of 2.6-2.8eV [1, 2] having a strong absorption within the solar spectrum (440 nm) that exhibit superior electronic and optical properties. Tungsten has many oxidation states i.e. 2,3,4,5 and 6 [3]. In recent years; WO_3 has been studied for its gas sensing properties, making it about the fifth most researched metal oxide for this purpose [4]. Tungsten also forms other oxides such as WO , W_2O_3 and W_4O_3 , however in gas sensing the stable WO_3 form is used. The crystal structure of tungsten trioxide is temperature dependent, shows five phase transitions with the sequence viz. tetragonal at temperatures above 740 °C, orthorhombic from 330 to 740 °C, monoclinic from 17 to 330 °C, and triclinic from -50 to 17 °C. Many researchers pointed out that these phases are affected by many factors including temperature, impurity and substrate material. These films have been widely studied for various applications such as photo catalysis [5], high density memory devices, smart windows [6], gas sensor [7, 8], photoelectrochemical water splitting, and electrochromism [9-11].

Electrical and optical characteristics of tungsten trioxide are dependent on the crystalline structure [12-16]. In addition to the above phases, a metastable hexagonal WO_3 phase has also been reported around 400°C [17]. Gullapalli et al. have successfully deposited tungsten trioxide thin films by using radio frequency reactive magnetron Sputtering technique [18] and conclude that the films prepared at 100-300 °C could be the best

Measurement Studies: Mixing Properties of Binary Liquid Mixtures of Ester with Alkanols at Various Temperature

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ABSTRACT

Thermodynamic investigations have often been used in complementary mode to obtain information about structural and interaction phenomenon about various salvation processes. Thermodynamic and transport properties provide important for the design of industrial process, to improve our understanding of molecular interaction existing in liquid mixture. In recent years there has been considerable advancement in the experimental investigation of the excess thermodynamic properties of liquid mixture. A survey of literature shows that very few attempts have been made to study viscosities of binary liquid mixtures containing ester. The density and viscosity have been measured for the binary liquid mixtures of ethyl benzoate with linear alkanols (C_1 - C_5) at (298.15, 303.15 and 308.15)K. The experimental density (ρ) and viscosity deviation ($\Delta\eta$). The V^E and $\Delta\eta$ values have been fitted in McAllister polynomial.

Keywords: Density (ρ), viscosity deviation ($\Delta\eta$), binary liquid mixtures.

INTRODUCTION:

Accurate knowledge of thermodynamic mixing properties of such binary mixtures has great relevance in theoretical and applied areas of research. These data are needed for design processes in chemical, petrochemical and pharmaceutical industries. Usually for non ideal mixtures, direct experimental measurements are performed over the entire composition range. Many times predictive methods for excess quantities would be more useful than the direct experimental measurements, especially when quick estimates are needed. Most empirical approaches for calculating the excess properties attempt to explain solution non ideologies in terms of specific or non specific intermolecular interactions.

EXPERIMENTAL WORK:

When two non electrolyte liquids (A+B) are mixed, the resulting change in volume, viscosity, compressibility, enthalpy, Gibbs free energy etc. may be considered as the sum of several contributions due to change in the combinational energetic free volume and molecular or orientation order and due to steric hindrance¹⁻². If either A or B or both are polar or polarisable molecules, ordered distributions and ordered creation upon mixing give rise to additional contributions which have opposite signs in the thermodynamic mixing functions³⁻⁴.

Viscosity data and excess thermodynamic functions of binary mixtures have been used by various workers to know the nature of interaction between their components. Relations between viscosity and excess thermodynamics functions are also known from the viscosity data.

RESULT AND DISCUSSION:

It is seen that excess molar volume values for binary mixtures of ethyl benzoate+ methanol is negative at all temperatures while those for mixtures containing ethanol to pentanol are positive at all temperatures. The observed excess molar volumes may be discussed in terms of several effects which may be arbitrarily divided into physical, chemical and geometrical contributions. The physical interactions involved mainly dispersion forces giving positive contributions. The chemical or specific interaction results in a decrease in volume and these include charge transfer type forces, i.e. forming or breaking up of H bonds and other complex forming interactions. It is well known that alcohols exist as associated structures in the liquid state. This association

Influence of Firing Temperature on Nature of Screen Printed WO₃ Thick Films

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ABSTRACT

This study focuses on the effect of firing temperature on the nature of tungsten trioxide thick film made by screen printing process for gas sensing application. X-Ray diffractometer (XRD) is used to analyze the phases formed after firing. XRD result shows that a mixture of monoclinic, orthorhombic phases of WO₃ was observed in the range 600-700°C. The morphology was analysed by SEM-EDS. The D.C. resistance of the films was measured by half bridge method in air atmosphere at 30-450°C temperature range. The films showed decrease in resistance with increase in temperature indicating semiconductor behaviour. The TCR, activation energy and sheet resistivity, surface to bulk ratio of films were evaluated at different firing temperatures. The film fired at 600°C was used for gas sensing purpose since the surface-to-bulk ratio is much greater than the film fired at other temperatures.

Keywords: WO₃, XRD, TCR, activation energy.

INTRODUCTION:

WO₃ is an n-type semiconductor with a reported band gap of about 2.6 -2.8 eV [1] WO₃ has perovskite-type ABO₃ lattice with A site, which remains unoccupied site. The WO₃ is considered as oxygen-deficient or non-stoichiometrical oxide has many oxidation states i.e 2,3,4,5 and 6. The crystal structure of tungsten trioxide is temperature dependent, shows five phase transitions in accordance to the following sequence : It is tetragonal at temperatures above 740 °C, orthorhombic from 330 to 740 °C, monoclinic from 17 to 330 °C, and triclinic from -50 to 17 °C . Hexagonal tungsten trioxide is an intermediate meta-stable form of WO₃. Such electronic properties make the tungsten oxides suitable for gas sensors [2]. The aim of present work is to prepare WO₃ thick films by screen printing technique on alumina substrate and to investigate its characteristics when subjected to different firing temperature.

EXPERIMENTAL:

Powder, paste and thick film preparation:

The WO₃ powder (Sigma Aldrich, AR grade, purity 99.99 %) was weighed and calcined in air at 4500C for 1_2^1 hrs. The calcined WO₃ powder was crushed and mixed thoroughly with glass frit as permanent binder and ethyl cellulose as a temporary binder. The mixture was then mixed with butyl carbitol acetate as a vehicle to make the paste. The paste was used to prepare thick films on alumina substrate by using standard screen printing technique [3-4]. After the printing, sensors were left at room temperature for a couple of hours so as to

NO₂ Gas Sensing Properties of Screen Printed WO₃ Thick Films

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Abstract

Nitrogen dioxide gas sensors based on semiconducting tungsten trioxide (WO₃) were produced using a commercially attractive and low-cost thick-film screen printing process. WO₃ powder obtained from a commercial source sigma Aldrich (99.99% purity) was used as functional material. The developed films were characterized by scanning electron microscopy and x-ray diffraction techniques. These techniques were used to investigate the phase composition of the films. Gas sensing was carried out in static gas sensing chamber. The change in resistance was noticed for different operating temperatures and different concentrations of pollutant gases like NO₂, NH₃, LPG, Ethanol, H₂S and O₂. The data indicates that NO₂ gas sensing behaviour was shown by the films at 290°C. Films showed sensitivity of 24.31% for NO₂ gas. Films showed fast response of 16 s to NO₂ gas and quick recovery within 42 s.

Keywords: Thick films, WO₃, NO₂, X-Ray diffraction, Sensitivity.

INTRODUCTION

The developed techniques for our needs have benefited us in all life spheres. This progress, which has advantages, also involves serious flaws related to our nature. Furthermore use of cooking gas through pipe lines in modern houses, may become a fire hazard due to lack of proper gas-leak alarms. Growing modernisation and factories growth and ever increasing pollution from vehicles have resulted into huge air pollution. Adverse and serious environmental issue has promoted the development of sensors with both high sensitivity and low response time. In recent years, p and n-type semi conducting oxides have led innovation in the gas sensors technology. Sensors play an important role in the areas of emissions control, environment conservation, public safety, and human well being¹⁻². Nitrogen dioxide is a toxic with pungent smell. When NO₂ combine with hydrocarbon and oxygen, form cloud over polluted area which affect the human and plant life adversely³⁻⁵. According to safety guidelines, the threshold limiting value (TLV) for NO₂ is less than 3 ppm for periods longer than 7 to 8 hours.

In this paper, we deal with the NO₂ sensing property of screen printed WO₃ thick films.

EXPERIMENTAL WORK

Powder, paste and thick film preparation:

The WO₃ powder (Sigma Aldrich, AR grade, 99.99 %) was weighed and calcined in air at 450 °C for 1 ½ hrs. The calcined WO₃ powder was crushed and mixed thoroughly with glass frit⁶ as permanent binder (to achieve adhesion of a film to the Alumina substrate and which can stand at working temperatures) and ethyl cellulose as a temporary binder. The mixture was then mixed with

Synthesis and ammonia gas sensing study of Al doped WO₃ nanoparticles

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Abstract

Screen printed thick films of WO₃: Al was prepared. WO₃: Al films were also explored by XRD, SEM and EDAX technique. Gas sensing properties of the WO₃: Al films were studied. The films were observed to be most sensitive to NH₃ gas. The obtained results are discussed and interpreted.

1. Introduction

Gas sensor is important because there are many gases that can be harmful to organic life, such as humans or animals. Oxygen, CO₂, humidity should be kept at adequate levels for our survival, while harmful gases should be controlled to be under the safety levels. Nowadays, there is a tremendous progress in production of sensing devices in order to monitor environment against toxic and combustible gases. There is also a great need of these kinds of sensors to carry out the optimization of combustion reactions in the emerging transport industry and in domestic and industrial applications. Solid state gas sensors show low response time, simple implementation and low cost [1-3]. Transition metal oxides such as WO₃, ZnO, SnO₂, Fe₂O₃, ZrO₂ etc. appear to be best candidates for semiconductor gas sensors [4]. The sensitivity of these devices is based on the dependence of resistivity of metal oxides on the ambient condition. Nevertheless, full development of such devices requires an improvement of their characteristics by the introduction of proper metal additives [5]. These additives enhance the material sensitivity, selectivity and stability [6,7]. Another important property is that the presence of metallic additives can also modify the growth kinetic. The amount and distribution of the metal is the most important parameter to be controlled in order to obtain the highest sensitivity [8].

WO₃ belongs to the P2₁/n space group which is N-type semiconducting material belongs to group-VI metal oxide [9-10]. Due to defects such as oxygen vacancies and W interstitials, which form donor levels, WO₃ possesses high n-type conductivity. WO₃ gets high transparency in the near-ultraviolet and visible spectral regions. Wide conductivity domain and conductivity varies under photo reduction/oxidation condition. Accordingly WO₃ has several applications in chemical sensors, electro photography, heterojunction solar cells, conductive transparent conductors, surface acoustic wave devices, and many others. In terms of thermal aging in air or corrosive environments pure WO₃ films lack stability [11-12]. To enhance their electrical, structural and optical properties different additives are added to polycrystalline WO₃ films such as copper (Cu),

Indoor Power Generation by Vaseline Glass Plate Doped with Non-Fermi Liquid behaviour of Electron Metals ($U_xTh_{1-x}PdSi_2$, $x \leq 0.07$)

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ABSTRACT:

Supplementing day-to-day energy requirement using renewable sources of energy is essential. However, highly fluctuating nature of renewable sources necessitates storage. Storage is expensive and has to be replaced periodically. Hence there is need to integrate available power, which may be indoor or outdoor. In this project an innovative stand alone, indoor energy generation by light system is proposed by doped VGP with non-fermi liquid materials ($U_xTh_{1-x}PdSi_2$, $x \leq 0.07$) with empirical formula. The CFL Radiations are subjected towards Solar PV⁶Plate through the doped VGP to improve the efficiency of Solar PV Panel.

Keywords: Vaseline Glass Plate (VGP), Compact Fluorescent Lamp (CFL) Yellow-Green Color Light(Y-G-CL) &Yellow Light (YL) and Non-Fermi Liquid (NFL).

INTRODUCTION:

Every house hold utilizing CFL lamp in the range of 2 watt to 25 watt, A very large amount of lights are used to lightening the houses, bungalows, Industries & along the streets. The solar cells are acting as an intermittent source, even in day time efficiency is less and tracker is required. To utilize the power there is need of huge no of storage batteries, which needs to replace periodically. By this proposed system, μW power will be generated by single CFL, using the same Solar PV panel; the efficiency of CFL is more than LED lamp. By the empirical formula VGP is doped with Non-fermi liquid materials [1-3]. The doping elements Uranium metal with silica glass has capability of converting U. V. Radiation in to visible, Thorium coating is used to improve the rate of electron in cathode. Palladium is more precise than Silver having high transparency and silicon used in manufacturing process of Vaseline Glass material [4]. When CFL bulb is switched ON, it emits visible as well as UV radiations. There is a strong source UV radiation near by it, up to the limit of 10 cm. Visible radiations are directly related with power generation but also the whole amount UV radiations are converted in visible radiations which increase the efficiency of solar PV plate.

CHEMICAL PROCESS:

Vaseline Glass Plate-VGP was produced in 1840 from Uranium Oxide known as Uranate. Uranate is ternary oxide which involves the elements of uranium in one of the oxidation state +4, +5 or +6 [5]. The uranates are of two types. First one is compounds of exact composition and second one is synthesized by combination of metal oxides. Uranate are found in yellow cake, the empirical formula is MxU_2O_7 . For example, Barium diurate BaU_2O_7 , UO_6 , where octahedral units are joined by sharing edges forming infinite crystallographic chains. The normal uranium colour glass in the form of vaseline illuminates yellow or yellow-green colour depends on oxidation states and concentration of metal ions in presence of U.V. light or lamp it fluorescence's bright green colour also beads absence of light source with black background reference figure 1.



(a)

Preparation and Characterizations of Bi-Doped Tin Oxide Thin Film Gas Sensor

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ABSTRACT

Bi-doped thin film samples were prepared by physical vapour deposition technique. The Bi-doped tin metal was deposited on pre-cleaned standard glass substrates with above technique. The film samples were then annealed at various temperatures for 2 hrs. and were characterized for studying structural, morphological, electrical and gas sensing properties by XRD, FESEM, static gas sensing system respectively. Preparation of thin film samples, structural, surface morphological and elemental analysis are explained in this paper.

Keywords: Bi-doped tin oxide, physical vapour deposition, XRD, FESEM.

INTRODUCTION:

Since last few decades, among various oxides, SnO₂ (tin oxide) semiconductor films have been widely employed in recognition of volatile organic compounds as stable gas sensors. They are also used in monitoring the environment, industries etc. [1], as window layer in solar cells [2], as gas sensors to sense hazardous gases like CH₄, CO, NO_x, CNG etc. [3-5]. SnO₂ and TiO₂ are promising gas sensors because [6-9] of their advantages like low cost, simple fabrication methods, and rapid response and recovery times [10].

Doping is one expected method of enhancing the conductivity and stability of the sensor by incorporating an atom or ion into host material [11, 12]. Although numerous studies have been conducted on the electronic and optical properties of different semiconductor oxides doped with metals, only a few theoretical studies exist on metal (M)-doped semiconductors oxides [13-15]. The present study aims to systematically study the effect of Bi doping concentration on the structural properties, conductivity and stability of SnO₂ by combining theoretical calculations with our experiments. We have successfully fabricated Bi-doped SnO₂ thin solid films by using Physical Vapour Deposition. The prepared film samples were analyzed using X-ray diffraction (XRD), FESEM, EDAX, Static gas sensing system etc.

PREPARATION OF THIN FILM SAMPLES:

Thin film samples were prepared by using Physical Vapour Deposition Technique. Pre-cleaned standard glass substrates were placed on a specially designed mask exactly above the tungsten filament containing tin wire and a lump of Bi. Appropriate amount of current was passed through the filament with the help of dimmerstat for evaporating tin and Bi. The evaporated material got deposited onto the glass substrates mounted on the mask. These samples were then heated at about 1250°C for 24 hrs for maximum oxidation of the deposited material. These samples later were annealed at 300, 400 and 500°C for 2hrs. and stored in a desiccator. They were then analyzed for structural, morphological, electrical and gas sensing characterizations by XRD, FESEM and static gas sensing system respectively. Fig.1 shows the vacuum system employed for deposition purpose.



JUSPS-B Vol. 30(5), 64-67 (2018). Periodicity-Monthly



Section B



Estd. 1989

JOURNAL OF ULTRA SCIENTIST OF PHYSICAL SCIENCES
An International Open Free Access Peer Reviewed Research Journal of Physical Sciences
website:- www.ultrascientist.org

The Young's Modulus of Cu, Al, Fe, Stainless Steel and Wood by using Y by bending of a bar Technique

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Acceptance Date 18th April, 2018,

Online Publication Date 2nd May, 2018

Abstract

Y by bending of a bar technique is a simple and easy technique to determine Young's modulus of Material such as Cu, Al, Fe, Stainless Steel, Wood etc. This technique require Traveling microscope, metal bar, two knife edges, weights etc. This technique can easily and accurately record the change in the dimensions of a bar under the load and measure depression at certain load by Traveling microscope. It has wide application in science and engineering. It is found that values of Young's modulus obtained by using Y by bending of bar in close agreement with standard values of Y of material. The young modulus of iron was found highest 14.2128×10^{11} dyne/cm² by Y by bending method.

Key word: Traveling microscope, Y by bending, Material Bar.

Introduction

The Main Purpose of this Research is to determine Young's modulus of any material by Y by bending of bar technique. This technique has wide advantages over other technique. And its will be advantages in civil Engineering to build up bridge². If A Solid is formed when large number of atoms come together and arrange themselves in a three dimensional lattice. These atoms are held together by inter atomic forces that can be represented by spring. When these springs are stiff we perceive the object as rigid. for example objects like table, chair etc. on the other hand objects like rubber band, garden hoses do not seem to be rigid. This is because in case of these objects the lattice is not rigid and objects have long flexible molecular chains where each chain is loosely bound to its neighbor⁸. These objects seem elastic. If we stretch the steel wire with some weight it gets elongated but when weight is withdrawn it regains its original position^{1,8}. If we go on continuing the

Preparation and Characterization of Titania Thick Film Resistors

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ABSTRACT

Titania (TiO₂) thick films prepared by standard screen printing technique and fired at different temperatures in air atmosphere. The compositional, morphological and structural properties of films were analyzed by Field Emission scanning electron microscopy (FESEM), Energy dispersive spectroscopy (EDS) and X-ray diffraction (XRD). The films were observed to be oxygen deficient, it indicates that the films are non-stoichiometry in nature. As deposited and fired films were analyzed using SEM to know its surface morphology. XRD showed the polycrystalline nature having anatase and mix anatase-rutile structure. The crystallite size changes from 25.1695 nm to 62.3517 nm for strong orientation (101) with increase in firing temperature. The role of firing temperature on electrical resistivity has been studied and showed decrease in resistance with increase in temperature.

Keywords: Thick films, FESEM, XRD, Structural properties, Electrical properties.

INTRODUCTION:

Screen printing technique was introduced in the later part of 1950's to produce compact, robust and relatively inexpensive hybrid circuit for many purposes. Later on thick film technique has attracted by the sensor field [1]. Thick films are suitable for gas or humidity sensors since the gas sensing properties are related to the material surface and the gases are always adsorbed and react with the films surface [2]. Screen printing is simple and economical method to produce thick films of various materials [3-10]. The semiconducting metal oxides such as TiO₂, SnO₂, ZnO, Fe₂O₃, and WO₃ etc. offer the potential for developing portable and inexpensive gas sensing devices, which have advantages of simplicity, high sensitivity and fast response. The sensor is a device senses input signal. The working principle of these semiconductor gas sensors is based on change in conductivity when exposed to the target gases [11]. TiO₂ is a widely studied transition metal oxide and behaves as n-type semiconducting oxide due to non-stoichiometry. It has been widely studied for several applications in photoelectrical and optical fields and used as gas sensor. Several deposition methods have been used to grow TiO₂ films such as Spray pyrolysis, Vacuum evaporation, chemical vapor deposition, magnetron sputtering, pulsed laser deposition, sol-gel technique, screen printing technique [12]. Titanium dioxide can be synthesized in three crystalline phases: rutile, brookite and anatase [13]. TiO₂ in the anatase crystalline phase is one of the most studied materials for photocatalysis properties than rutile. Among the various metal oxides that can be used in gas sensors,

Oh

Effect of Bi doping on Electrical and Gas Sensing Properties of Tin Oxide Thin Film Gas Sensor Prepared by Physical Vapour Deposition Method

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Abstract

Pure and doped thin solid films were prepared by Physical Vapour Deposition (PVD) Technique on glass substrates. Temperature of substrates was changed from 50°C to 375°C. Gas sensing properties of the films was tested for various gases for this temperature range using static gas sensing unit. Sensitivities of the undoped and Bi-doped films were measured to be 5.83 and 9.53 respectively. These sensitivities were found at operating temperatures 75°C and 150°C respectively.

Keywords :- Tin oxide, PVD technique, thin films, sensitivity.

INTRODUCTION

Since decades metal oxide semiconductor, like tin oxide, thin films have been widely used as gas sensors. Such materials are used for detection of gases like acetone, ammonia, methane, H₂S with their sensing ability up to a few ppm levels [1–3]. These materials sense the target gases by exhibiting change in resistance of the films with reference to the film resistance in the absence of these gases. The ratio of the resistances gives sensitivity of the sensor or sensing material towards the gas under consideration. [3–6]. The sensitivity of these materials depends upon operating temperature range also. Therefore, performance of the sensors is tested with variation in its temperature. Generally, sensor performance is observed to be maximum at a particular operating temperature. Many metal oxide semiconducting materials showed these properties. [7–10]. Tin oxide is a versatile material which is sensitive to most of the gases and hence is poor selective. To have a good compromise, doped metal oxide thin films are being used recently. Selection of the dopant is obviously wanted to improve selectivity towards the target gas, achieve better stability of the sensing layer over longer duration and at higher operating temperatures. Doping also improves the sensing properties by changing the grain size and structure through the introduction of surface defects and impurity level. Various synthesis methods such as sol-gel, RF sputtering, electrospinning, spray pyrolysis, vacuum evaporation etc. have been employed [11–15].

EXPERIMENTAL DETAILS

In the present work, the tin oxide thin films were prepared by physical vapour deposition method. Pure tin metal was evaporated in vacuum ($\sim 10^{-5}$ torr) onto the pre-cleaned standard glass substrates. The formed thin metal films were then heated in muffle furnace at 150°C for 24 hours for getting oxidized. They were later on annealed at 300, 400 and 500°C each for 2 hours. Those film samples annealed at 400°C

Burnout and Coping among Elite Athletes

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ABSTRACT

Objectives: The present research was framed to study the burnout and coping among elite athletes.

Methods: The sample included a total of 30 elite athletes (Cricket, Football and kabadi) in Nashik city. Two measures were used i.e. Maslach Burnout Inventory (MBI) and Coping strategies Inventory (CSI) by David Tobin. Means and SDs were computed and Pearson product moment correlation was applied to check the relationship between burnout and coping among elite athletes.

Result: The correlation score between emotional exhaustion, personal accomplishment subscales of burnout and coping is negatively correlated. And Depersonalization and coping is positively correlated with coping. It indicates that higher the level of burnout lower the coping ability.

Conclusion: The result revealed that negative relationship was found in two subscales of burnout and positive relationship between one subscale of burnout and coping pattern of elite athletes. It indicates that higher the level of burnout lower the ability of coping and lower the burnout higher the ability of coping among elite athletes.

Keywords: Burnout, Coping and Elite Athletes.

INTRODUCTION:

Burnout is the reaction to the chronic type of stress which involves negative kind of interactions between the personal and environmental characteristics. According to the Dick & Wagner (2001) burnout is the result of prolonged exposure to stress. Burnout is a chronic condition which develops when a person is working too hard for long period of time in high-pressure conditions. Burnout is often responsible for human service occupations, and is thought to be an imbalance between resources and demands that causes stress (Maslach & Jackson, 1985). Burnout is effecting on psychological as well as physical health that produced the symptoms such as anxiety, tension, fatigue, insomnia, exhaustion, and depression (Cherniss, 1992).

Burnout leads to physical and emotional exhaustion, cynicism, and a lowered sense of self-efficacy which is responsible for work related stress. (Weiten W & Lloyd M., 2004 7th ed)

- Exhaustion: Involves chronic fatigue, weakness, and low energy.
 - Cynicism: Negative attitudes towards oneself, one's work, and life in general.
 - Reduces self-efficacy: Declining feelings of competence at work, feeling of hopelessness and helplessness.
- Burnout is a cumulative stress reaction to ongoing occupational stressors. Factors in the workplace promote burnout included over workload, interpersonal conflicts at work place, lack of control over work responsibilities and outcomes and inadequate recognition for one's work.

COPING:

A Person's mental & physical health depends on their ability to cope effectively with stress. Coping refers to reduce or tolerate the demands which are created by the stress.

"Coping means to invest own conscious efforts to solve the personal and interpersonal problems in order to try to minimize or tolerate the stress and conflicts".

A number of researchers have attempted to identify and classify the various coping techniques that people use in dealing with stress. The number of coping strategies are available but people come to choose on some strategies more than others. It means individuals have their own style of coping which is depending on situational

Children's Sports Participation and the Development of the Social competence: The Comparative study

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ABSTRACT

The purpose of this study was to analyze the impact of engaging in sports activities in the development of the social competence. Social Competence is an important ingredient of modern civilization and the essential attribute of the members of a progressive onward moving society. Current researches showing sufficient evidences that the social competence which is important ingredient of emotional intelligence is far more important in the global performance of the individual than merely high intelligent quotient.

This is the comparative study done on school children from 12 to 16 years age among 3 different groups. These are children, those engaged in the group sports activities, those engaged in individual sports activities, and those who are not engaged in the sports activities.

Results reveals that participation in sports activities is associated with higher social competence development than students who are not engaged in sports activities in any form. In that also social development is slightly more in children who are engaged in the group sports activities than children who are engaged in Individual sport activities. The children who are engaged in the virtual play station, mobile games or computer games and not in physical activities are excluded or incorporated under the no engagement in sports group.

The study reinforces the idea that apart from getting many health benefits, sports activities participation also has significant role in the development of the social competence that is overall social development of children.

Keywords: Sports Participation, Social Competence.

INTRODUCTION:

In the current scenario education system is giving more importance to the mental development and significantly ignoring the physical activities. Only some of children who are bright sportsmen, are involved in sports activities, all others engages themselves into the mental activities and study. Current education system is developing graduates and postgraduates but with weak bodies and poor physique.

Numerous studies shows that social development of a person is more important in global performance and not merely IQ. So schools are also trying to inculcate the holistic education policies in curriculum, still it is limited to mental activities. So to establish the correlation between the physical activities that involves sports, group activities and the social development.

Social competence is important phenomena in the social development. Social competence is defined as social ability and interpersonal skill (Eisler, 1976) of an individual in effectively meeting a person-situation interaction or successfully dealing with individual environmental factors.

The success of an individual in the society depends largely on the extent to which he has acquired richness and potency of social competence desirable for his self-actualization, growth and development. For a successful interpersonal interaction a high order of social competence is an essential disposition of an individual.

Diana Rathjan (1980) reported some of the criteria of social competence. They are: Social power, Social Relation, Social skills, Social Mobility, Social attraction, Communicability, Social Participation etc.

SHOPPING ADDICTION AND ITS RELATION WITH DEPRESSION AMONG WORKING AND NON-WORKING MARRIED WOMEN

Mrunal. A. Bhardwaj* and Jaimala. A Sode **

People with a shopping addiction get a high from buying things. Shopping addiction, also known as compulsive buying disorder. It's described as the compulsion to spend money regardless of need or financial needs. Any type of addiction has some Psychological variables related with it. In the present scenario the shopping addiction is found to be on rise. And it is mostly found in women. That is why the samples have been chosen in this manner. So the present research study was framed to investigate both the difference and relationship between Shopping Addiction and Depression among Working and Non-working married women. The sample consisted of 60 married women (30 Working and 30 Non-working) in Nasik city, with the age range from 25 to 35 years. The psychological tests administered on both the groups were the Bergen's shopping addiction Scale and Beck's Depression inventory. For the statistical analysis, the test and the correlation methods were applied result revealed that there is significant difference found related to shopping addiction and the depression level among the working and non-working married women. The result also leads to a conclusion that, there exists positive relationship between shopping addiction and the level of depression.

Shopping Addiction

Shopping addiction is elaborated as an inappropriate, excessive out of control spending, other types of addiction it is basically has to do with impulsiveness and lack of control over its impulses. Shopping addiction can effect on a person's life, family and finances.

According to Illinois Institute of Addiction Recovery :

Compulsive shopping is described as a Pattern of Chronic, Repetitive, Purchasing that is difficult to stop and ultimately result in harmful consequences it is defined as an

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Personality Traits and Self-Esteem Among Female Players in Male Dominated Sports

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ABSTRACT

Objectives: The present research was framed to study the personality traits and its relation with self-esteem among female players in male dominated sports.

Methods: The sample included a total of 30 females. The criterion test was administered on the sample to find out the correlation among the personality traits and self-esteem.

Result: The Mean values were computed and Pearson product movement correlation was applied to check the relationship between Personality traits and Self-esteem. The result revealed that the positive relationship was found in Personality Traits (Openness to expression, Conscientiousness, Extraversion, Agreeableness) and self-esteem. And the negative relationship was found in Personality trait (Neuroticism) and Self-esteem.

Conclusion: On the basis of obtained results researchers concluded that Personality Traits (Openness to expression, Conscientiousness, Extraversion, Agreeableness) leads to the high level of self-esteem and Personality Traits (Neuroticism) leads to low level of self-esteem.

Keywords: Personality Traits, Self-esteem, Female Players, Male dominated Sports.

INTRODUCTION:

Personality is a set of individual differences that are affected by the development of an individual: values, attitudes, personal memories, social relationships, habits, and skills. Different personality theorists present their own definitions of the word based on their theoretical positions. The term "personality trait" refers to enduring personal characteristics that are revealed in a particular pattern of behavior in a variety of situations.

Allport defined personality as "The dynamic organization within the individual of those psychophysical systems that determine his characteristic behavior and thought".

PERSONALITY TRAITS:

Broadly there are five parameters which describe an individual's personality. These five dimensions are also called as "Big Five" Factors, and the model is referred to as Five Factor Model also abbreviated as FFM. The Five Factor Model was initially proposed by Costa & McCrae in the year 1992 and often describes the relation between an individual's personality and various behaviors. Following are five personality traits of an individual:-

Openness to expression: Individuals with Openness to expression to experience are generally very active, have a tremendous inclination towards creativity and aesthetics and listen to their heart i.e. follow their inner feelings.

Conscientiousness: As the name suggests, individuals with a Conscientiousness personality trait listen to their conscience and act accordingly. Such individuals are extremely cautious and self-disciplined.

Extraversion and Introversion: Carl Jung popularized both the terms - "Extraversion" and "Introversion".

Extraversion: Extraversion refers to a state where individuals show more concern towards what is happening outside. Such individuals love interacting with people around and are generally talkative.

Introversion: Introversion, on the other hand refers to a state when an individual is concerned only with his own life and nothing else.

Emotional Maturity and Level of Optimism Among Players

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ABSTRACT

Objectives: *This research was coined to study the Emotional Maturity and the level of Optimism among players.*

Methods: *The sample included a total of 30 males. The test was administered on the sample to find out the correlation between Emotional Maturity and Optimism.*

Result: *The Mean values were computed and Pearson product movement correlation was performed to find out the relationship between Emotional Maturity and Optimism. The result revealed that the positive relationship was found in Emotional Maturity and Optimism*

Conclusion: *On the basis of obtained results researchers concluded that Emotional Maturity leads to high level of Optimism.*

Keywords: Emotional Maturity, Optimism, Male Players.

EMOTIONAL MATURITY:

In order for an athlete to display maximum sports performance at any level essential to cultivate and display emotional maturity, the ability to use logical thoughts to make mature decision during competition. The display of emotional maturity, or lack of, definitely played a role in the on –field performance. Waking up the other team through actions emotional immaturity and getting even right away can backfire. Emotional maturity is probably the most difficult “ability” to acquire. A player must play with high emotion. Cultivating maturity as an athlete begins when a child enters the world of competitive sports. The maturing process never stops. All athletes who can keep emotions in check during competition have better chance to succeed.

OPTIMISM:

Abraham Lincoln once said an optimist as someone who “finds opportunity in every difficulty” while a pessimist to be someone who ‘finds difficulty in every opportunity. Other way to be an optimistic is a person who like to be overcome all the obstacles which comes in his/her path.. Explanatory style examines the way an individual explains the way an individual explains their experiences, successes and failures (Scheier & Carver,1985 In. Martin-Krumm et al, 2003). Looking at how many people explain certain events, or the reason behind the athletes’ success or failure, we can see if they are optimistic or not. We can also use people’s explanatory style to predict biases, and future outcomes because of their expectations of success and failures (Seligman, 1991).

Optimistic explanatory style (Peterson, 2000):

1) Positive events:-internal (within persons control) stable (this reason will always be there) and global (effects everything) causes e.g. we won the game because I am talented.

2) Negative event:-external (outwith person’s control), unstable (the reason is only temporary) and specific (only effects that certain situations) factors e.g. we lost the game because the other team scored a lucky goal.

REVIEW OF LITERATURE:

1) Tracey, et.al (1995) conducted a research on the transition experience of first year university track and field students athletes. A narrow range of sports programs. The social requirement of living with other s also made

Recent Trends in Sports Psychology Research

A Study of International Journal of Physical Education, Sports and Health

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ABSTRACT

The current archival study focuses on research in sports psychology that is published in "International Journal of Physical Education, Sports and Health". It aims to understand recent trends in the research of sports psychology. The results show that nearly thirteen percent of the articles focused on psychological variables that affects sports performance. The scores show that Mental Health and Psychological Skills as well as Anxiety and Stress are studied on a larger scale. The little emphasis is given on Gender differences, Attitude, Team Performance, Leadership and Coaching. These variables can be studied in future research.

Keywords: sports psychology, International Journal of Physical Education, Sports and Health.

INTRODUCTION:

Sports psychology is an applied discipline of psychology that focuses on psychological factors that affect sports performance. As the awareness for sports and its importance as a career choice and its beneficial effects on physical and mental health is increasing with time, psychologists have started focusing on the research in this area. The field is gaining recognition and popularity in current research in psychology. It is important to know the recent trends in area to improve sports performance. There are many different ways to trace to analyze recent trends in specific area of psychological research. It can be done by analyzing keywords of articles that are published in flagship journals, looking for emergence of professional organizations and new journals, mapping subject matter of dissertations, spotting out the grants received for research projects and universities. The current study aims at understanding recent trends in sports psychology research.

METHOD:

Material:

The study aims to understand recent trends in research in Sports Psychology. It focuses on research in sports psychology that is published in "International Journal of Physical Education, Sports and Health". The tool of data collection used in this study is Archives. The necessary information is gathered from an official website i. e. www.kheljournal.com. It is a bi-monthly peer reviewed journal of impact factor of (RJIF): 5.38 with Print ISSN: 2394-1685, online ISSN: 2394-1693. An important reason to select this journal for current study is that it has open access. It is mentioned on the official website of journal that all articles published are made freely and permanently accessible online immediately upon publication, without subscription charges or registration barriers. Another practical reason is that the sufficient data is available on a website in an interpretable manner. The first issue of journal is published in September 2014. Till now it has published 21 issues, 105 volumes (mentioned as parts) and around 1197 articles approximately from the authors of thirty five countries across the world.

Procedure:

The study is conducted in following steps:



Role of Vitality in Initiating Personal Growth and Grit among Students

M. A. Bhardwaj* & S. A. Raravikar**

Abstract

This study attempted to identify the relation of vitality with personal growth initiative and grit. It was hypothesized that all the three variables would be positively correlated with one other. The Subjective Vitality Scale by Ryan and Fredrick (1997), Personal Growth Initiative Scale II (PGIS II) by Christine Robitschek and The Short Grit Scale by Duckworth, Peterson, Matthews, & Kelly, (2007) were used to collect data. The statistical analysis of scores using Pearson Product Moment Correlation revealed that all the three variables do correlate positively with one other. The vitality scores are associated with higher personal growth Initiative ($r=0.42$). The correlation between vitality and grit is also positive ($r= 0.26$). But the personal growth initiative and grit are only weakly correlated ($r=0.012$).

Keywords: *Vitality, Personal Growth Initiative and Grit*

Feeling alive and energetic is critical to initiate and sustain any action. It is near to impossible to act without this feeling and it seems that people who feel more lively and energetic are more likely to initiate and sustain actions. The central idea of this article is to know whether people who feel more alive and energetic are more likely to initiate and sustain actions that are important to them. It is an attempt to identify the relationship of Vitality, Personal Growth Initiative and Grit.

An individual with vitality is more enthusiastic about life, people and new experiences and is more lively, having general energy for life. Vitality is defined as “energy that is perceived to emanate from the self” (Ryan & Frederick, 1997). It is seen that when vital, people experience a sense of enthusiasm, aliveness, and energy available to the self (Ryan & Deci, 2008; Ryan & Fredrick, 1997) Subjective Vitality is defined as one's conscious experience of possessing energy and aliveness (Ryan and Fredrick, 1997). It is positively correlated with physical health, psychological

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LOCUS OF CONTROL AND ACHIEVEMENT MOTIVATION AMONG WOMEN ENTREPRENEURS OF SMALL ENTERPRISES

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ABSTRACT

The present paper discusses the nature and relationship of locus of control and achievement motivation among women entrepreneurs. Since high achievement motivation and internal locus of control are found to be associated with successful entrepreneurship, 40 women entrepreneurs from manufacturing sector of small scale industries are taken as participants for the present study. Their age ranges from 20 to 40 years with at least five years of experience in the field. The mean scores from women entrepreneurs having been internally controlled and high achievement motivation Product moment correlation of locus of control and achievement motivation is found to be negligible.

Keywords: entrepreneurship, achievement motivation, locus of control, small enterprise, manufacturing sector



Effect of Yoga on Level of Depression among Females suffering from Polycystic Ovarian Syndrome (PCOS)

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(Received 09 November, 2017, Accepted 02 December, 2017)

(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: The present research was framed to study the effect of yoga training program on level of depression among females suffering from PCOS disease. The sample included a total of 30 females. The criterion test was administered on the sample at the preliminary stage and after that the yoga training program was implemented and then compared the pre and post scores of depression. The result shows that there was a difference between pre-test and post test score regarding level of depression. The result revealed that yoga training program was beneficial for managing the level of depression among PCOS females. On the basis of obtained result researchers can conclude that with the help of yoga PCOS females can cope up with level of depression.

Keywords: Level of Depression, Yoga, females suffering from PCOS

I. INTRODUCTION

A. Depression

Depression is a common mood disorder it is negatively affected on persons thinking, feeling and behavior. It leads variety of emotional and physical problems. Depression is more than sadness. People suffering from depression experience lack of interest in daily activities, weight loss or gain, lack of sleep or excessive sleep, lack of energy, excessive guilt and re current thoughts of suicide.

Women experience depression twice as compare to men. Some factors such as biological, life cycle, hormonal and other factors unique in women and it may linked to their higher level of depression rate. Mood is affected by the various PCOS symptoms. According to Farrell and Antoni (2010) women with PCOS experience mood dysfunction and psychiatric problems to a greater degree than women without PCOS. Many studies show that level of depression is higher in PCOS than healthy women [2].

B. Polycystic ovarian syndrome (PCOS)

PCOS it is a common health problem among women. This problem caused by hormonal imbalance. PCOS Caused by small cysts in the ovary which affect the hormones and dispute the normal menstrual cycle. Around 5-10 % women are diagnosed with PCOS.

Women are suffered from PCOS because of excessive level of stress and strain, perennial tension, following modern faculty life style and some psychological problems like anxiety and depression.

C. Symptoms of PCOS

Irregular Periods, Ovarian cyst, pimples, excessive hair fall, abdominal bloating, mood swings, miscarriage, Irritability, hair growth on the face, weight gain, muscles enlargement, imbalance level of sugar in blood, PCOD can also cause type 2 diabetes and heart attack.

The aim of the study was to measure the level of depression among females suffering from polycystic ovarian syndrome and to find out the effect of yoga on level of depression among females suffering from polycystic ovarian syndrome

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Perception, Identity and Peace

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ABSTRACT

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Our sense of identity has so much bearing on our individual and social be
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understand identity formation and consequent discrimination we nee
perception. Perception is formed as a result of our experiences; the way
events and behavior of significant others. It is evident throughout human h
people treat "others" with disdain and contempt. The world has witnessed
violence as a result of prejudice and discrimination. Discrimination can be se

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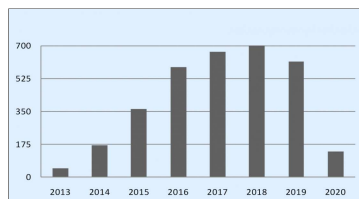
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Personality and perceived stress among medical college students

Author: Mrunal A Bhardwaj and Jaimala A Sode

Objectives: The present research was framed to investigate the relationship between personality traits (Neuroticism and Psychoticism tendencies) and perceived stress among medical college students. **Methods:** The sample included a total of 60 students. Two measures were used i.e. Hans Eysenck personality questionnaire (EPQ-R) and Sheldon Cohen perceived stress scale. Means and SDs were computed and Pearson product movement correlation was applied to check the relationship between personality traits and perceived stress among medical college students. **Result:** The correlation score between neurotic personality trait and perceived stress is 0.45 and it is significant at 0.01 level. It indicates that higher the level of neuroticism greater the perceived stress. The correlation score between psychoticism personality trait and perceived stress is 0.43 and it is significant at 0.01 level. These indicate the correlation between psychoticism personality trait and perceived stress is negative. **Conclusion:** The result revealed that relationship was found in neurotic and psychotic tendencies with perceived stress. On the basis of obtained result researchers can conclude that personality (neurotic and psychotic tendencies) leads to significant alleviation of perceived stress.

Keywords: Personality traits, Perceived stress and medical college students

How to Cite this article:

Mrunal A Bhardwaj and Jaimala A Sode. 2017, Personality and Perceived Stress among Medical College Students. Int J Recent Sci Res. 8(2), pp. 15727-15729.

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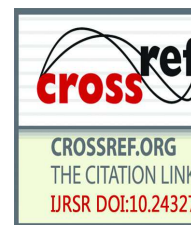
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- ISSN: 0976-3031
- Impact Factor: 7.383
- Print Issue: Available
- Frequency: Monthly
- Subject: Multidisciplin
- Submission Date: Ope
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- DOI: 10.24327/IJRSR
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Burnout and Personality Traits Among Athletic Trainers

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ABSTRACT

Objectives: The present research was framed to study the burnout and personality traits among athletic trainers worked in the college setting.

Methods: The sample included a total of 30 males athletic trainers working in the various colleges in Nashik city. Two measures were used i.e. Hans Eysenck personality questionnaire (EPQ-R) and Maslach Burnout Inventory (MBI). Means and SDs were computed and Pearson product moment correlation was applied to check the relationship between personality traits and burnout among athletic trainers worked in college setting.

Result: The correlation score between neurotic personality trait and the scores of three subscales of burnout is positively correlated. It indicates that higher the level of neuroticism greater the burnout. The correlation score between psychotic personality trait and the three subscales scores of burnout is positively correlated. It indicates that higher the level of psychoticism greater the burnout.

Conclusion: The result revealed that relationship was found in neurotic and psychotic tendencies with burnout. On the basis of obtained result researchers can conclude that personality (neurotic, psychotic and extroversion tendencies) leads to burnout among athletic trainers employed in college setting.

Keywords: Burnout, Personality Traits and Athletic trainers.

INTRODUCTION:

Burnout is the reaction to the chronic type of stress which involves negative kind of interactions between the personal and environmental characteristics. According to the Dick & Wagner (2001) burnout is the result of prolonged exposure to stress. Burnout is a chronic condition which develops when a person is working too hard for long period of time in high-pressure conditions. Burnout is often responsible for human service occupations, and is thought to be an imbalance between resources and demands that causes stress (Maslach & Jackson, 1985). Burnout is effecting on psychological as well as physical health that produced the symptoms such as anxiety, tension, fatigue, insomnia, exhaustion, and depression (Cherniss, 1992).

Burnout leads to physical and emotional exhaustion, cynicism, and a lowered sense of self-efficacy which is responsible for work related stress. (Weiten W & Lloyd M., 2004 7th ed)

- Exhaustion: Involves chronic fatigue, weakness, and low energy.
- Cynicism: Negative attitudes towards oneself, one's work, and life in general.
- Reduces self-efficacy: Declining feelings of competence at work, feeling of hopelessness and helplessness.

Burnout is a cumulative stress reaction to ongoing occupational stressors. Factors in the workplace promote burnout included over workload, interpersonal conflicts at work place, lack of control over work responsibilities and outcomes and inadequate recognition for ones work.

Personality:

Personality is that pattern of characteristics thoughts, feeling, and behaviors that distinguished one person from another and that persists over time and situations.



Effect of Yoga on Level of Depression among Females suffering from Polycystic Ovarian Syndrome (PCOS)

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(Received 09 November, 2017, Accepted 02 December, 2017)

(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: The present research was framed to study the effect of yoga training program on level of depression among females suffering from PCOS disease. The sample included a total of 30 females. The criterion test was administered on the sample at the preliminary stage and after that the yoga training program was implemented and then compared the pre and post scores of depression. The result shows that there was a difference between pre-test and post test score regarding level of depression. The result revealed that yoga training program was beneficial for managing the level of depression among PCOS females. On the basis of obtained result researchers can conclude that with the help of yoga PCOS females can cope up with level of depression.

Keywords: Level of Depression, Yoga, females suffering from PCOS

I. INTRODUCTION

A. Depression

Depression is a common mood disorder it is negatively affected on persons thinking, feeling and behavior. It leads variety of emotional and physical problems. Depression is more than sadness. People suffering from depression experience lack of interest in daily activities, weight loss or gain, lack of sleep or excessive sleep, lack of energy, excessive guilt and re current thoughts of suicide.

Women experience depression twice as compare to men. Some factors such as biological, life cycle, hormonal and other factors unique in women and it may linked to their higher level of depression rate. Mood is affected by the various PCOS symptoms. According to Farrell and Antoni (2010) women with PCOS experience mood dysfunction and psychiatric problems to a greater degree than women without PCOS. Many studies show that level of depression is higher in PCOS than healthy women [2].

B. Polycystic ovarian syndrome (PCOS)

PCOS it is a common health problem among women. This problem caused by hormonal imbalance. PCOS Caused by small cysts in the ovary which affect the hormones and dispute the normal menstrual cycle. Around 5-10 % women are diagnosed with PCOS.

Women are suffered from PCOS because of excessive level of stress and strain, perennial tension, following modern faculty life style and some psychological problems like anxiety and depression.

C. Symptoms of PCOS

Irregular Periods, Ovarian cyst, pimples, excessive hair fall, abdominal bloating, mood swings, miscarriage, Irritability, hair growth on the face, weight gain, muscles enlargement, imbalance level of sugar in blood, PCOD can also cause type 2 diabetes and heart attack.

The aim of the study was to measure the level of depression among females suffering from polycystic ovarian syndrome and to find out the effect of yoga on level of depression among females suffering from polycystic ovarian syndrome

9. Teaching and Learning in Post Graduate Classes: At College Level

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Abstract

In 21st century the change has occurred in each and every field. Therefore education cannot be far behind. Technology has now become an integral part of our life. Teaching & Learning are the backbone of any educational system. But, unfortunately, whenever there is a question regarding education or reforms in education only the role of a teacher is considered and the role of a student is out rightly ignored, which is incorrect because the learner's role is as much of important as of a teacher's. In this paper our focus would be on the role of teachers as well as students as far as Teaching & Learning process is concerned.

Key Words: Teaching, Learning, Education, Role of Teacher, Learning at PG, Ideal teacher.

'Teaching' and 'Learning' are seminal in any educational system the other being 'Evaluation'. Evaluation comes at the end (of course, after Teaching & Learning) and Teaching and Learning comes at the very beginning, in any educational process, hence vital. In 'Teaching & Learning' teachers and students are indispensable, teacher's role in teaching and student's role in learning, in any educational process respectively. Teaching & Learning is a team work as any team sport is, for succession it requires the active participation of each member of the team same could be applicable in educational process where teacher's participation is as much important as of students. Without student's active participation, however the good teacher be the end goal would never be achieved.

Role of Education in Human Life

Plato regards education as a means to achieve justice, both individual justice and social justice. According to Plato, individual justice can be obtained when each individual develops his or her ability to the fullest. In this sense, justice means excellence. For the Greeks and Plato,



Dr. B. R. Ambedkar and Nationalism

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Abstract:

Dr. B. R. Ambedkar was the champion of the rights of downtrodden his point of view on various issues was logical, neutral and impartial. Nationalism has always been the most debated topic in the social, political and academic circle. There has always been the support and the deriders of the Nationalism in every Ages since its inception in the Eighteenth Century. Nationalism has dominated the psyche of the masses. Ambedkar, being a humanitarian, has put forth a humanitarian perspective of Nationalism. In this paper the researcher has tried to focus upon Ambedkar's perspective regarding Nationalism and how his concept of Nationalism differs from his contemporaries.

Keywords: Nationalism, Anti-nationalism, Congress's Nationalism, Hindu Nationalism.

Introduction:

Dr. B R Ambedkar (1891-1956) also known as Babasaheb, was an Indian Jurist, Economist, Politician, Social Thinker, Reformer and Critic, Historian, Anthropologist, Journalist and a genuine scholar of his time. His contribution in building Modern India as a Constitution maker, also referred as the Father of Indian Constitution, is regarded highly. But he is, above all, popularly known as the emancipator of the Dalits (erstwhile untouchables), but unfortunately the tag of "Emancipator of the Dalits" has stuck to him and he is only known as the leader of the Dalits, which, of course, he was not. Being a Dalit himself he swallowed many humiliations in his life time but he continued his struggle for equal rights, which in the end he successfully achieved, albeit on the paper. Ambedkar, by articulating his contrary view that of Congress, which was called as anti-national, the research would also focus upon this anti-nationality of Ambedkar.

In today's post-truth world, nationalism is a very darling topic for the politicians as well as the media. In this age of social-media, where everyone has something to say or comment upon, without giving a prior thought, people are in the race of labeling people, those who hold opposite views or opinions of them, as anti-national. This fascist attitude of today's social-media generation, born after 1996, is not confined to the one country. This cancer of nationalism has spread throughout the world. Nationalism, initially, related only to the so called third world country. But nowadays it is found in the most so called developed countries like Britain and United States of America and in Europe as well. During the Brexit movement those who opposed the exit of Britain from the European Union are labeled as Anti-nationals, same is happening in the United States of America those who are opposing policies of President Trump are labeled as anti-national and similarly in India too, where those who are not agree with the Present BJP government are labeled as anti-national. What is anti-national? What makes someone anti-national? Nationalist calls people anti-national who holds opposite opinion to those of nationalists. It's the most easiest and the simplest way to suppress and deride



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गावगाडा आणि गावगाड्याचे बदलते स्वरूप

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भारतीय समाज आणि संस्कृती ही विविधतेने नटलेली आहे. मराठी संस्कृती तर इथल्या लोकांच्या गेजच्या जगण्यातून व्यक्त होत असते. लोकांचे राहणीमान, धार्मिक जीवन, सणसमारंभ, चालीरीती, रुढी, परंपरा एकंदरीतच समूहजीवन आणि या सर्वांना व्यापून टाकणारा 'गावगाडा' याचा विचार अग्रक्रमाने करावा लागतो. दिवसेंदिवस अनेक बदल होत असताना आपण बघतो. पण हे बदल नेमकी कोणते आहेत हे समजून घेण्यासाठी मुळात ही व्यवस्था कशी होती हे समजणे आवश्यक ठरते. भारतात अनेक रंगक गूढ मनाला अस्वस्थ करणाऱ्या तसेच अनाकलनीय अशा गोष्टी आहेत. त्यातीलच एक म्हणजे गावगाडा. गावगाडा या शब्दात प्राचीन भारतीय संस्कृती समाजव्यवस्था सामावलेली आहे. गावे कधी अस्तित्वात आली हे सांगणे कठीण आहे पण सर्वसाधारणपणे जेव्हा शेतीची अर्थव्यवस्था स्थिर झाली त्यावेळी गावे अस्तित्वात आली असावीत. गावगाडा म्हणजे भारतीय समाजव्यवस्थेचा कणा. गावगाडा हा कुणी एका व्यक्तीने समुहाने वा समाजाने तयार केला नसून तो काळाच्या ओघात समाजाच्या गरजांनुसार विकसित झालेला आहे. महाराष्ट्रात गावगाडा म्हणजे बलुतेदारी व्यवस्था समजली जाते. बलुतेदारी ही गावगाड्यातील मूलभूत अशी व्यवस्था होती. तिच्या आधारेच गावगाडा चालायचा. पण बलुतेदारी म्हणजेच गावगाडा असे

नाही. बलुतेदारी ही फक्त वस्तू आणि सेवा यांच्या देवाणघेवाणीपुरतीच मर्यादित आहे. गावगाडा ही अतिराय व्यापक आणि गुंतागुंतीची व्यवस्था आहे. पूर्वीपासूनच शेती हा आपल्या अर्थव्यवस्थेचा सर्वात महत्त्वाचा भाग राहिला आहे. शेतकऱ्याला वेष्ट्रिभूत ठेवून त्याच्या भोवताली गावगाडा होता. कारुणारू व शेतकरी एकमेकांचे दुःखा समजून घेत पिढ्यान्पिढ्या जगत होते. गावात शेतकऱ्याबरोबरच इतर कुटुंबेही वेगवेगळे व्यवसाय करीत राहात होती. मात्र हे व्यवसाय जातव्यवस्थेनुसार केले जात होते. या जातव्यवस्थेमध्ये व्यवसाय हे वंशपरंपरागत होते. जात, कुटुंब आणि व्यवसाय यांची घट्ट सांगड घातली गेली होती. या जातव्यवस्थेला धार्मिक अधिष्ठान होते. जातींशी निगडित रुढी परंपरांच्या माध्यमातून धर्म हा माणसांच्या जीवनाचे नियंत्रण करीत होता. या गावगाड्यात प्रत्येक व्यक्ती किंवा संस्था आपण जे कर्तव्य आणि वर्तन करतो आहोत ते धर्मावरण आहे अशा विश्वासाने ते करत होती. व्यक्तिधर्म, कुटुंबधर्म, जातिधर्म, व्यवसायधर्म, वतनधर्म असे शब्दप्रयोग त्यामुळेच प्रचारात आलेले होते. आपल्याला नेमून दिलेले कर्तव्य हाच आपला धर्म आहे. ही भावना गावगाड्यात होती. धर्माचरणाप्रमाणेच प्रत्येक जातसमूहाने देवही ठरलेले असत. शिवाची पूजा गुरव, गौसाची, जंगम करीत. हनुमान विष्णूची पूजा बैरागी करीत. देवीची पूजा भूषे आराधी गोंधळी हिजडे करीत. भैरोबाची पूजा भराडी, कृष्णची, माळी करीत. खंडोबाची पूजा बाभ्यामुरळी करीत. मरीआईची पूजा महार मांग करीत. कृष्णाची पूजा मानभाव करीत. लोकसंस्कृतीचे उपासक आणि लोकव्रत्ताकार हेही गावगाड्यातील घटक होते.

गाव हा समूह असला तरी त्याचे मूलभूत एकक कुटुंब हे होते. पितृसत्ताक व्यवस्थेमध्ये एकत्र कुटुंबपद्धती होती. एकत्र कुटुंबात ज्याप्रमाणे एक मुख्य पुरुष त्याची मुले त्यांच्या बायका नातवंडे आणि या परिवारावर अवलंबून असणारे इतर नातेवाईक असे स्वरूप असायचे. त्याचप्रमाणे गावगाड्यानीही रचना होती. गावगाडा म्हणजे एकंदर गावचे एकत्र कुटुंब. त्यात कृष्ण ही हा कारभारी

साहित्य आणि वृत्तपत्र : एक अनुबंध

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अनेक मान्यवर अभ्यासक, समीक्षक रविवार पुरवणीत ग्रंथपरीक्षणे लिहित असतात. रविवार पुरवणीतील ग्रंथपरिचयाने वाचकांचा साहित्यविषयक दृष्टिकोन विकसित होण्यास मदत झाली आहे. साहित्यकृती व लेखकांना मिळालेले पुरस्कार, साहित्यविषयक घडामोडी, साहित्यसंमेलने, नाट्यसंमेलने, कवितासंमेलनाचा वृत्तान्त, साहित्यविषयक वाद-मतमतांतरे, नवोदित लेखक व त्यांच्या साहित्याचा परिचय वृत्तपत्रांच्या माध्यमातूनच वाचकांना होत असतो.

लोकशिक्षण आणि लोकजागृती करणे, जनसंपर्काचे, समाजप्रबोधनाचे, सामाजिक अन्वयापरिचय, लढणाऱ्या आणि बाबकबागांवर अनेक अंगांनी प्रभाव टाकणारे वृत्तपत्रे हे प्रमुख माध्यम आहे. लोकसत्ता, वाचा फोडणे, लोकांना खरी माहिती देणे, लोकांचे प्रबोधन करणे हे वर्तमानपत्राचे मूळ उद्देश आहे. १८३२ साली बाळशास्त्री जांभेकरांनी 'दर्पण' हे मराठी माषेतले पहिले वृत्तपत्र मुंबईत सुरू केले. सामाजिक, राजकीय, वैचारिक, साहित्यविषयक उद्बोधन व भरणपोषण करण्याचे मराठी वृत्तपत्रे नेहमी शतकातील कार्य विंगेप उल्लेखनीय आहे. विष्णुशास्त्री चिपळूणकर, लोकमान्य टिळक, गोपाळ गणेश आगरकर, लोकहितवादी, महात्मा ज्योतिबा फुले, न. चि. केळकर, कृष्णाजी प्रभाकर खाडिलकर, जयचंदा बळवंत कोल्हटकर, हरिभाऊ आपटे, डॉ. बाबासाहेब आंबेडकर यांसारख्या साहित्यिक-विद्वानांनी वृत्तपत्रे बनवले आहेत.

मराठी वृत्तपत्रीय लेखनाने मराठी वाङ्मयात मोलाची भर घातली आहे. प्रारंभापासून वृत्तपत्रांचा आणि साहित्यिकांचा निकटचा संबंध आहे. जुन्या व नव्या पिढीतील श्रेष्ठ साहित्यिकांनी आपले लेखनीचे पहिले धडे वृत्तपत्रांच्या आखात्यातच घेतले आहेत. चिपळूणकर, आगरकर, टिळक, परांजी हरिभाऊ आपटे, केळकर, खाडिलकर, भावे यांच्या लेखनीचे तेज व साहित्यगुण वृत्तपत्रांतूनच दिसून आले. 'दर्पण', 'प्रभाकर' तंत्राच्या मराठी वृत्तपत्रांचा मागोवा घेताना त्यातील साहित्याला पोषक वातावरण, साहित्यविषयक कामगिरी सहजपणे नजरे भरते. 'ज्ञानोदय' हे वृत्तपत्र धर्मप्रसारासाठी सुरू झाले असले तरी नवनवीन संशोधने लोकांपर्यंत पोहोचविण्याचे काम या वृत्तपत्राने सातत्याने केले आहे. महात्मा मुलाभाजी स्वतंत्र मजकुराची पाने देऊन सर्व बयोगटाच्या वाचकांना सामावून घेण्याचा मराठीतील पहिला मान 'ज्ञानोदय'कडेच जातो.

१८४९ मध्ये कृष्णाजी श्रवक रानडे यांनी सुरू केलेल्या 'ज्ञानप्रकाश' या वृत्तपत्राच्या संपादक मंडळीत कृष्णशास्त्री चिपळूणकर, लोकहितवादी, न्यायमूर्ती रानडे, गोपाळ कृष्ण गोखले, महादेवशास्त्री कोल्हटकर या विद्वानांचा समावेश होता. 'ज्ञानप्रकाश'चे पुढील संपादक काकासाहेब लिमये यांनी होते.

सहकार, राजकारण, इतिहास संशोधन, समाजसुधारणा, साहित्य अशी विविध सदरे सुरू केली. 'काव्यशास्त्र-विनोद' हे 'ज्ञानप्रकाश'चे वैशिष्ट्यपूर्ण सदर होते. समासंमेलनांचे विस्तृत वृत्तान्त आणि प्रमुख व्यक्तींची भाषणे विस्तारपूर्वक देण्याचा उपक्रम या वृत्तपत्राने सुरू केला. १८५३ मध्ये कृष्णशास्त्री चिपळूणकरांनी 'विचारलहरी' हे वृत्तपत्र सुरू केले. मराठी संपादकीय लेखनाची नवी परंपरा या वृत्तपत्राने सुरू केली. पुढे लोकमान्य टिळक, गोपाळ गणेश आगरकर, अच्युत बळवंत कोल्हटकर, आचार्य अत्रे, पु. भा. भावे, बेहरे यांचे संपादकीय लेखन वाङ्मयगुणांनी समृद्ध झालेले दिसते. १८७४ मध्ये विष्णुशास्त्री चिपळूणकरांनी 'निबंधमाला' सुरू झाली. निबंधमालेतून 'स्वदेश', 'स्वातंत्र्य', 'स्वधर्म' यांचा जोरदार पुरस्कार केल्याने समाजात स्वतंत्रताची, राष्ट्रवादाची जागृकता बाबना निर्माण झाली. १८८० मध्ये पुण्यातून सुरू झालेल्या 'पुणे वैभव' या वृत्तपत्रातून प्रसिद्ध कादंबरीकार हरी नारायण आपटे यांच्या लेखनाला सुरुवात झाली. ३ जानेवारी १९८१ मध्ये जळगावात 'प्रबोधचंद्रिका' हे वृत्तपत्र सुरू झाले. या वृत्तपत्राच्या संपादकांनी कवितेला वाहिलेले 'काव्यरत्नावली' हे मासिक सुरू केले. पुढे ५० वर्षे हे मासिक सुरू होते. १८८१ मध्ये 'कैसरी' व 'मराठा' ही वृत्तपत्रे टिळक-आगरकरांनी सुरू केली. 'कैसरी'ने पुढे पद्मनाभ बर्वे महाराष्ट्राच्या सामाजिक, राजकीय आणि स्वातंत्र्य चळवळीचे नेतृत्व केले. 'पुनःधर हरि ओम' या ऐतिहासिक अग्रलेखाने टिळकांनी स्वातंत्र्य चळवळीची सुरुवात केली. नाटककार कृष्णाजी प्रभाकर खाडिलकर, न. चि. केळकर हेही काळपरतले 'कैसरी'चे संपादक होते. टिळकांशी मतभेद झाल्याने गोपाळ गणेश आगरकरांनी 'सुधारक' हे स्वतंत्र वृत्तपत्र सुरू केले. 'कैसरी', 'निबंधमाला', 'सुधारक' या वृत्तपत्रांतून साहित्याला पोषक वातावरण निर्माण झाले.

प्रसिद्ध साहित्यिक हरी नारायण आपटे यांनी 'करमणूक' हे पत्र सुरू केले. यापूर्वी 'पुणे वैभव' या वृत्तपत्रातून हरिभाऊंच्या कादंबऱ्या प्रकाशित झाल्या होत्या. 'करमणूक' या पत्रात हरिभाऊंनी दीर्घकथा, लघुकथा, चरित्रे, प्रवासवर्णने, कविता यांना प्राधान्य दिले. 'पण लक्षात कोण घेतो' सारख्या कादंबऱ्या, 'मार्शलफिल्ड' चरित्रासारखी उद्बोधक चरित्रे, स्फुट गोष्टी, टीकापर लेखन, धोरांची चरित्रे, चटकदार बातम्या यांच्या समावेशाने 'करमणूक' हे पत्र लोकप्रिय झाले. १८९८ मध्ये शिवराम महादेव परांजपे यांचे 'काळ' हे वृत्तपत्र सुरू झाले. १९१५ साली अच्युत बळवंत कोल्हटकरांनी 'संदेश' हे वृत्तपत्र सुरू केले. 'संदेश'ने अनेक नवीन सदरे, आकर्षक बातम्या, राजकारण, समाजकारण, नाट्यपरीक्षणे इत्यादी नवनवीन विषय हाताळून वृत्तपत्रांचे रूपच बदलून टाकले. 'आमचे हे बडील नव्हेत', 'टिळक बाळंत झाले' आणि संपादकीय व सदरे यांचा उत्कृष्ट साहित्यात समावेश होतो. १९२० च्या सुमारास डॉ. बाबासाहेब आंबेडकरांनी पत्रकारितेत प्रवेश केला. त्यांनी दलित चळवळीचे मुखपत्र 'मूकनायक' हे वृत्तपत्र सुरू केले. 'बहिष्कृत भारत'चे संपादकही डॉ. बाबासाहेब आंबेडकरच होते. व्यापक संपादकीय विचार आणि जातिधर्मनिरपेक्ष धोरण हे आंबेडकरांच्या पत्रकारितेचे वैशिष्ट्य होते. लोकहितवादींनी ७५ वर्षांपूर्वी लिहिलेल्या 'शतपत्रांचे' त्यांनी पुनर्मुद्रण केले. आचार्य प्र. के. अत्रे यांनी 'मराठा' हे दैनिक सुरू केले. 'मराठा' या वृत्तपत्राने आणि 'नवयुग' या साप्ताहिकाने वृत्तपत्रसृष्टीत एक इतिहास निर्माण केला. अनेक साहित्यिक व व्यक्तिगत वाद 'नवयुग' साप्ताहिकातून पुढे आले. 'नवयुग' हे साप्ताहिक अज्यांनी 'मराठा' वृत्तपत्राच्या रविवार आवृत्तीत विनीत केले. आचार्य अत्र्यांचे वैचारिक लेखन, मृत्युलेख, विडंबनात्मक लेखन वृत्तपत्रातून



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आज भारतातील सर्वच राज्यांत विद्यार्थ्यांमध्ये स्पर्धा परीक्षांची प्रचंड आवड आणि आकर्षण निर्माण झाले आहे. महाराष्ट्रातील स्पर्धा परीक्षा देणा-या व स्पर्धा परीक्षांची तयारी करणा-या विद्यार्थ्यांची संख्या दिवसेंदिवस वाढतच आहे. करिअरचा एक चांगला पर्याय म्हणून स्पर्धा परीक्षांना प्राधान्य देण्याची मानसिकता मराठी पालकांमध्ये आणि विद्यार्थ्यांमध्ये वाढली आहे. ही अत्यंत चांगली बाब आहे. विद्यार्थी अधिक सकारात्मकतेने स्पर्धा परीक्षांकडे बघू लागला आहे. यामध्ये ग्रामीण आणि शहरी भागातील दरी स्पष्टपणे जाणवते. स्पर्धा परीक्षांची तयारी करण्यासाठी ग्रामीण भागातून शहरी भागात येणा-या विद्यार्थ्यांची संख्या प्रचंड वाढत आहे. पुणे, मुंबई, नाशिक, औरंगाबाद, नागपूर या शहरांकडे ग्रामीण भागातील विद्यार्थ्यांचा कल जास्त प्रमाणात असल्याचे दिसून येते. या शहरांमध्ये अभ्यासिकांची संख्यादेखील लक्षणीय प्रमाणात वाढली आहे. अभ्याससाहित्य त्या अभ्याससाहित्याची उपलब्धता, संबंधित विषयासाठीचे क्लासेस, परीक्षेसाठीची जाहिरात केव्हा व कशी येणार आणि एकंदरीतच स्पर्धा परीक्षांसाठी आवश्यक असणारे पूरक शैक्षणिक पर्यावरण यासाठी ग्रामीण भागातील विद्यार्थी शहराचा आसरा घेताना दिसतात. पण स्पर्धा परीक्षांकडे वळण्यामागे केवळ शासकीय नोकरी, सरकारी बंगला, लाल दिव्याची गाडी, सामाजिक प्रतिष्ठा इ. यांचेच नुसते आकर्षण असून चालणार नाही तर नेमकेपणाने काय साध्य करावयाचे आहे याविषयीची स्पष्टता असणे अधिक आवश्यक आहे.

स्पर्धा परीक्षांचा प्रामाणिकपणे अभ्यास करणा-या विद्यार्थ्यांबरोबरच अनेक हौसे, नवसे, गवसे देखील या परीक्षांना बसत असतात. स्पर्धा परीक्षा नक्की कशा असतात याची चाचपणी करण्यासाठी बरेचजण या परीक्षेला बसतात. आपण काहीतरी करित आहोत अशा चुकीच्या मानसिकतेसाठीही काही विद्यार्थी परीक्षा देत असतात. समाजातील, नात्यागोत्यातील लोक विचारत असतात; तू काय करतोस...? या प्रश्नाला उत्तर देण्यासाठीही या परीक्षेला बसणा-यांची संख्या अधिक आहे. अशा अनेक कारणांमुळे एकूणच स्पर्धा परीक्षांना बसणा-या विद्यार्थ्यांची संख्या ही लाखोंवर जावून पोहोचते. या लाखोंच्या संख्येमध्ये माझं कसं होणार... असा नकारात्मक विचारदेखील अनेक विद्यार्थ्यांमध्ये येत असतो. आज आपल्याला असे अनेक उमेदवार भेटतात ज्यांना आय. ए. एस., आय. पी. एस. व्हायचे असते त्यासाठी यूपीएससी चे प्रयत्नसुद्धा सुरू असतात. पण एमपीएससीच्या विविध परीक्षांबाबत या उमेदवारांमध्ये निरुत्साह दिसून येतो. या परीक्षांबद्दल त्यांना नीटशी माहितीदेखील नसते. या परीक्षांमध्ये आम्हाला स्वारस्य नाही आम्ही फक्त यूपीएससीच करतो अशा ताठ्यात वावरणा-या उमेदवारांचाही एक वर्ग आहे. तर एमपीएससीच्या

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आधुनिक कवितेला राष्ट्रीयत्वाचे भान आणण्याचे कार्य राष्ट्रीय जागृतीच्या कालखंडाने (१८७४ ते १९०५) केले. या कालखंडात विष्णुशास्त्री चिपळूणकरांची 'निबंधमाला' अवतरली. आपल्या राष्ट्रीय अस्मितेचा अभिमान आविष्कृत करण्याचे आणि जनजागरणाचे क्रांतिकारक कार्य चिपळूणकरांनी केले. त्यांनी 'निबंधमाले'च्या द्वारे राष्ट्रीय अस्मितेचे बीजारोपण केले. इ.स. १८८५ ते १९०८ या काळात मराठी राष्ट्रीय कवितेला एक विशिष्ट वळण मिळाले. राजकीय अन्यायाचा निषेध करणे, राष्ट्रीय चळवळीचा प्रवाह काव्याद्वारा सामान्य जनतेपर्यंत पोचवून लोकजागृती करणे, ही त्यातील काही वळणे होत. १९०५ ते १९८८ हा राष्ट्रीय कवितेचा सुवर्णयुग म्हणून ओळखला जाणारा कालखंड लो. टिळकांच्या विचारांचा कालखंड म्हणूनही ओळखला जातो. या कालखंडात प्रचंड राजकीय चळवळ चालू होती. इंग्रजी सत्तेचे जुलमी, अन्यायी, अत्याचारी स्वरूप भारतीय जनतेला याच कालखंडात पाहवयास मिळाले. इंग्रजांच्या साम्राज्यवादी शक्तीला धक्के देण्याचे आणि इंग्रजी सत्तेविरुद्ध प्रचंड प्रक्षोभ निर्माण झाल्याचे चित्रही याच कालखंडात दिसून येते. याच कालखंडात लॉर्ड कर्झनने बंगालची फाळणी केल्याने वंगभंगाविरुद्ध देशात चळवळ सुरू झाली. या चळवळीच्या निमित्ताने लो. टिळकांनी स्वराज्य, स्वदेशी, राष्ट्रीय शिक्षण आणि बहिष्कार ही चतुःसूत्री देशापुढे ठेवली. सुशिक्षित तरुण राजद्रोहाकडे आणि सशस्त्र क्रांतीच्या मार्गाकडे वळलेला दिसून येतो. बंगाल, पंजाब आणि महाराष्ट्रात 'अभिनव भारत'सारख्या सशस्त्र क्रांतिकारकांच्या गुप्त संघटना अस्तित्वात आल्या. क्रांतिकारकांचे कट उघडकीला आले आणि त्यांना फाशी देण्यात आली. लो. टिळक, लाला लजपतराय, अरविंद घोष, बिपिनचंद्र पाल यांना शिक्षा झाल्याने देशात संतापाची लाट उसळली. राष्ट्रवादाचा पुरस्कार करणारी पुस्तके जप्त करण्यात आली, तर राजकीय वृत्तपत्रांवर बंदी घालण्यात आली. १८९५ मध्ये रायगडावर शिवाजी महाराजांचा राष्ट्रीय उत्सव संपन्न झाला.

१९०९ चा मोर्लेमिटो सुधारणा कायदा, पहिले जागतिक महायुद्ध, जालियनवाला बाग हत्याकांड, सावरकर बंधूंवरील खटले, शिक्षा, 'स्वराज्य हा माझा जन्मसिद्ध हक्क आहे' या मंत्राची घोषणा अशा अनेक प्रक्षोभक घटनांनी हा कालखंड व्यापलेला आहे. यामुळे भारतीय जनतेच्या मनातील पारतंत्र्याची चीड प्रथमच कृतीच्या द्वारे या कालखंडात निर्माण झालेली दिसते. भारताच्या आणि विशेषतः महाराष्ट्रीय जीवनातील जितका संघर्षमय तितकाच उज्ज्वल असा हा कालखंड आहे. या कालखंडातील कोणत्याही ध्येयवादी लढ्याला या संघर्षमय घटनांपासून अलिप्त राहणे अशक्य होते. त्याला सावरकरांचे मनःपिंड इतिहासावर पोसलेला असल्याने, त्यांचे व्यक्तिमत्त्व राष्ट्रवसादी असल्याने राष्ट्रीय क्षोभाचा परिस्फोट त्यांच्या कृतीतून आणि साहित्यातून होणे साहजिकच आहे.

सावरकरांचे व्यक्तिमत्त्व

स्वातंत्र्यवीर सावरकरांची जीवननिष्ठा राष्ट्रनिष्ठेशी एकरूप झालेली दिसून येते. सावरकरांचे जीवन हेच एक महान काव्य आहे. त्यात वीर, करुण, रौद्र, भयानक यासारख्या रसांचे तांडव आहे. त्यांची कविता तुरुंगाचे बुरूज फोडून, काळ्या पाण्याच्या लाटातून वर आलेली असली, तरी सावरकरांच्या जीवनात साहित्यनिर्मितीला दुय्यम स्थान आहे. राष्ट्रकार्य हेच त्यांची प्रमुख ध्येय असल्याने साहित्यनिर्मिती हे त्या साध्याचे केवळ एक साधन होते. त्यांचा पिंड मुळातच कवीचा असला तरी त्यांनी स्वीकारलेल्या ध्येयाशी ते अखेरपर्यंत प्रामाणिक राहिले, आणि ध्येयाच्या पूर्तीसाठी त्यांनी आपल्या कविता शक्तीलाही वापर केला. क्रांतिकारक सावरकर आणि राष्ट्रकवी सावरकर अशी दोन व्यक्तिमत्त्वे त्यांच्या ठायी असली तरी ती एकमेकांपासून अलग करता येणार नाहीत. इतकी ती एकात्म वाटतात. भारतमातेवरील नितांत भक्ती, बुद्धिवाद, विज्ञाननिष्ठा, स्वातंत्र्यनिष्ठा आणि जहाल हिंदुत्वनिष्ठा कारागृहात तुरुंगाच्या भिंतीवर महाकाव्य लिहिणारा महाकवी, विचारप्रवर्तक आणि शैलीदार गद्यलेखन करणारे निबंधलेखक, चरित्रकार, आत्मचरित्रकार, नाटककार इत्यादी गुणांनी त्यांचे व्यक्तिमत्त्व संपन्न आहे.

राष्ट्रनिष्ठा, हिंदुत्वनिष्ठा आणि विज्ञाननिष्ठा या तिन्ही निष्ठांचा उत्कट संगम त्यांच्या व्यक्तिमत्त्वात झालेला दिसून येतो. या तिन्ही निष्ठा त्यांच्या ठिकाणी अत्यंत प्रबळ होत्या. "राष्ट्र हे त्यांनी अंतिम नैतिक मूल्य मानले असल्यामुळे कोणत्याही विचाराचा कस ते नेहमी राष्ट्रहिताच्या कसोटीवर पाहतात." हे डॉ. विद्याधर पुंडलिक यांचे विधान सावरकरांच्या व्यक्तिमत्त्वावर पुरेसा प्रकाश टाकणारे वाटते.

सावरकरांनी ज्या जीवननिष्ठांचा बुद्धिपुरस्सर स्वीकार केला त्यांच्या प्रचारासाठी आणि प्रसारासाठीच त्यांनी आपले प्रज्ञा, प्रतिभा,

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लोकसाहित्याचे संशोधन

प्रा. डॉ. किरण नामदेव पिंगळे,

मराठी विभागप्रमुख,

लोकनेते व्यंकटराव हिरे महाविद्यालय,

पंचवटी, नाशिक

अलीकडे आंतरविद्याक्षेत्रीय संशोधनाला अधिक महत्त्व प्राप्त झाले आहे. समाजशास्त्र, मानसशास्त्र, मानववंशशास्त्र, पुरातत्त्वशास्त्र, इतिहास, अर्थशास्त्र, राज्यशास्त्र, भूगोल, पर्यावरणशास्त्र, धर्मशास्त्र, नीतिशास्त्र, तत्त्वज्ञान, पुराणे, देवता-विज्ञान इत्यादी शास्त्रांशी लोकसाहित्याचा परस्परसंबंध असतो. विविध दृष्टिकोनातून लोकसाहित्याचा अभ्यास व्हावा, असे अभ्यासकांना वाटते, इतके लोकसाहित्याचे क्षेत्र व्यापक आहे.

लोकसाहित्य हा अलीकडच्या काळातील एक अतिशय महत्त्वाचा असा आंतरविद्याक्षेत्रीय संशोधनातील विषय आहे. आज जागतिक पातळीवर लोकसाहित्याच्या अभ्यासाला अत्यंत महत्त्व प्राप्त झाले आहे. लोकसाहित्याच्या अभ्यासाच्या नव्या दिशा व नवे दृष्टिकोन उदयाला येत आहेत.

लोकसाहित्याच्या अभ्यासाचे महत्त्व सांगताना डॉ. बाबासाहेब आंबेडकरांनी काढलेले उद्गार मोठे सूचक आहेत, लोकसाहित्य ही आमच्या संस्कृतीची संपत्ती आहे. तिचे जतन व संवर्धन आम्ही केले पाहिजे. ती तर अत्यंत प्राचीन काळापासून हृदयपूर्वक सांभाळून ठेवलेली आमची मूल्यवान ठेव आहे. त्यात आमचा पूर्वइतिहास सामावलेला आहे. लोकसाहित्याचा अभ्यास म्हणजे लोकसंस्कृतीचा अभ्यास होय. लोकसाहित्यातून आपल्या संस्कृतीचे प्राचीनत्व, आचार-विचार, रितीरिवाज, रूढी-परंपरा, सण-उत्सव, शकून-अपशकून, धर्मश्रद्धा, लोकमानस, लोकजीवन, लोकाचार, लोकसमजुती, लोकेच्छा, मूल्यकल्पना, सांस्कृतिक वारसा, भाषावैशिष्ट्ये व लोकसंस्कृतीचे दर्शन घडते.

लोकसाहित्य संशोधनाची परंपरा

आपल्या देशात लोकसाहित्याची परंपरा अतिप्राचीन आहे. आपल्या देशात लोकसाहित्याचा साठा विपूल प्रमाणात आहे, पण लोकसाहित्याच्या अभ्यासाला अलीकडे सुरुवात झाली आहे. सन

१८७४ मध्ये सर विल्यम जोन्स यांच्या प्रयत्नाने कलकत्ता येथे या संस्थेची स्थापना झाली. त्यानंतर लोकसाहित्याच्या अभ्यासाला चालना मिळाली. २० व्या शतकात भारतातील विविध प्रांतात लोकसाहित्य संकलनाचे प्रयत्न होऊ लागले. मराठीमध्ये लोकसाहित्याच्या अभ्यासाची सुरुवात इतिहासाचार्य वि. का. राजवाडे यांच्यापासून झाली, असे मानले जाते.

महाराष्ट्रात लोकसाहित्याचे संकलन-संशोधन अनेक अभ्यासकांनी केले आहे. ना. गो. चापेकर, साने गुरुजी, वामनराव चोरघडे, काका कालेकर, कमलाबाई देशपांडे, डॉ. दा. गो. बोरसे यांनी लोकसाहित्याचे संकलन व संशोधनात मोलाची भर घातली आहे. डॉ. ना. गो. नांदापूरकरांनी मराठवाड्यातील लोकसाहित्याचे संकलन करण्याचे फार मोठे काम केले आहे.

अलीकडे डॉ. सरोजिनी बाबर, डॉ. दुर्गा भागवत, डॉ. तारा भवाळकर, डॉ. प्रभाकर मांडे, डू.रा.चिं.ढेरे, डॉ. गंगाधर मोरजे, डॉ.मधुकर वाकोडे, डॉ.शरद व्यवहारे, डॉ. विश्वनाथ शिंदे, डॉ. अनिल सहस्त्रबुद्धे, डॉ. द. ता. भोसले, डॉ.गोविंद गारे, डॉ.विनायक तुमराम, डॉ.धोंडीराम वाडकर, डॉ. पुरुषोत्तम कालभूत, डॉ. प्रतिमा इंगोले, डॉ.शैलजा देवगावकर, डॉ. पुष्पलता करनकाळ, डॉ. साहेब खंदारे, डॉ. बाळासाहेब गुंजाळ, डॉ. अलका हिवाळे अशी संशोधकांची मोठी परंपरा लाभली आहे. लोकसाहित्याच्या संशोधनात या अभ्यासकांचे योगदान फार मोठे आहे.

लोकसाहित्य संशोधनाच्या संधी

आजही महाराष्ट्रात सर्वत्र विखुरलेल्या विविध स्वरूपातील लोकसाहित्याचे संकलन, संपादन, प्रकाशन व संशोधन अधिक प्रमाणात होण्याची आवश्यकता आहे. लोकगीते, लोककथा, लोकनाट्य, म्हणी, उखाणे, दैवतकथा, डोंगरकथा इत्यादी स्वरूपातील लोकसाहित्य सामग्रीचे संकलन व संशोधनाला खूप मोठा वाव असून त्याची गरज आहे. लोकसाहित्याचे संशोधन नवी संशोधनदृष्टी, क्षेत्रीय अभ्यास व बदलत्या संदर्भानुसार करण्याची आवश्यकता आहे.

लोकसाहित्यात लोकसंस्कृतीच्या अनेक अंगांचा समावेश होतो. लोकसाहित्यात लोकप्रतिभेचा अविष्कार विविध अंगांनी व्यक्त होतो. लोकगीते, लोककथा, म्हणी, वाक्प्रचार, उखाणे, शिब्या, नीतितत्त्वे, तत्त्वज्ञान, धर्मश्रद्धा, दैवदैवते, लोकरूढी, लोकाचार, लोकतत्व, लोकसमजुती, सौंदर्यभावना, शकुनापशकुन, सण-समारंभ, लोककला, लोकवाद्ये, डोंगरकथा, त्या लोकसमूहाची सांस्कृतिक परंपरा, सामाजिक वाटचाल, कलाविषयक जाणीव, भाषा यांचा समावेश लोकसाहित्यात होतो. लोकसाहित्याचा अभ्यास हा लोकजीवनातील अनेक घटकांचा अभ्यास आहे. लोकसाहित्याची

कलात्मक बनू लागली.

मराठी नाट्यवाङ्मयात मराठी एकांकिकेने भर घातली असून मराठी नाट्यवाङ्मय समृद्ध केले आहे. मराठी वाङ्मयात गेल्या ३० ते ३५ वर्षात मराठी एकांकिकेने मोठी कामगिरी केली आहे. मराठी एकांकिकेने समर्थपणे मानवी जीवनदर्शन, अनुभवविश्व, समाजदर्शन प्रकट केले आहे. मराठी एकांकिकाही मराठी नाट्यवाङ्मयाचे आणि रंगभूमीचे एक महत्वपूर्ण, अविभाज्य अंग बनले आहे. दोन-अडीच शतकाच्या वाटचालीची परंपरा असणार्या मराठी एकांकिकेने प्रगतीचा टप्पा गाठला आहे. मराठी एकांकिकेच्या प्रवासात, मराठी एकांकिकेच्या स्वरूपात विविधतेचे दर्शन घडते.

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एकांकिकेचे घटक

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एकांकिका म्हणजे नाटकाच्या तुलनेत एका अंकाचे नाटक होय. नाटकामध्ये जास्त अंक असतात. परंतु स्थळ-काळाच्या मर्यादित अवकाशात आपल्या सर्व नाट्यशक्ती एककेंद्रित करणारा, उत्कट, एकसंध व एकजिनसी परिणाम साधणारा संपूर्ण, स्वयंपूर्ण, एक अंकी नाट्यप्रकार म्हणजे एकांकिका होय. एकांकिका हा एक अतिशय महत्त्वाचा कलाप्रकार आहे. दृक-श्राव्य स्वरूपाचा लोकप्रिय कलाप्रकार असल्याने तो प्रेक्षकांपर्यंत लवकर पोहोचतो व त्याचे आकलन प्रेक्षकांना होत असते. मानवाच्या जीवनाचे यथार्थ दर्शन एकांकिकाया कलाप्रकारातून अधिक प्रभावीपणे घडविले जाते. कथा, कविता, कादंबरी व इतर साहित्यापेक्षा नाट्य हा कलाप्रकार अतिशय प्रभावी आहे. इतर साहित्यप्रकारापेक्षा नाटककार नाटकाची व्याप्ती काळ, वेळ, अभिरूची याला अनुसरून निश्चित करतो. एकांकिकेचा विचार करत असताना एकांकिकेचा लेखक म्हणजेच नाटककार त्या एकांकिकेचा विषय, आशय, दिग्दर्शक, अभिनय, नट, कथानक, भाषाशैली, संवाद व संघर्ष या घटकांचा विचार करून ते एकांकिकेची निर्मिती करत असतो. एकांकिकेच्या स्वरूपाचा अभ्यास करताना आपणास एकांकिकेचे घटकव त्याची वैशिष्ट्ये यांचा विचार करणे महत्त्वाचे ठरते. एकांकिकेच्या घटकांचा विचार करतांना आपल्याला त्याचे दोन प्रकारात वर्गीकरण करता येते.

अ) एकांकिकेचे भाषिक घटक

ब) एकांकिकेचे अभाषिक घटक



International journal of basic and applied research

www.pragatipublication.com

ISSN 2249-3352 (P) 2278-0505 (E)

Cosmos Impact Factor-5.86

Ecotourism potential of Pandavleni caves or Nashik caves, Nashik district

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Abstract: *The aim of the present paper is to study the ecotourism potential of Pandavleni Caves or Nashik Caves and to study physical and biological features of study area and to find the role of stakeholder in sustainable environment, friendly development. Ecotourism is defined as 'responsible travel to nature areas that conserves the environment and sustains well being of local people'. Field visits and semi structure interview in an informal manner have organized to collect the primary data. Tourist groups have been set for action plan in form of tourists and then comes the hotels and local people of the area. The Buddha Leni or Pandu Leni are group of 24 caves carved between 1st century BCE and 3rd century through additional sculptures were added up to 6th century reflecting changes in Buddhist devotional practices. It is located 8th km south centre of Nashik, its 19° 56' 28" N latitude to 73° 44' 55" E. These caves are one of the oldest caves of Maharashtra, many people visit Buddha leni enjoys short trekking, mainly in monsoon season when mountain gives birth to many waterfall and lush greenery. The researcher summed up the result like period to stay, tourist's dislike about the area, transportation, Age and sex wise distribution, local food season wise flow of tourist to place, benefits from tourist, expectations of local people of ecotourism etc. the present paper will be helpful for students, scholars, researchers, tourists and Government and will be modest contribution in the field.*

Key words: Ecotourism, Buddha Leni, Tourist, Local People.

Introduction: The term ecotourism was coined by Hector Caballas Lascurian in 1983 defined as "Environmentally responsible for travel to natural areas, in order to enjoy and appreciate nature that promote conservation have a low visitor impact and provide for beneficially active socio-economic involvement of Local people"(IUCN).

The growth in Tourism in India is according to world travel and Tourism Council (WITC). It generated USD 208.9 billion in 2016, which is 7th largest in term of country's GDP, 40.3 million jobs are created as well.

Review of Literature: In a national as well as international level many case studies related to ecotourism and community based ecotourism are published; one such paper was Ecotourism in India by Abhishek Mukharjee in 2012. In this paper the researcher endeavored to understand the diverse tourism opportunities present in our country and various ways to enhance the income of our nation from tourism without hampering the ecological balance. Another case study was published in The

879 | Received: 5 June Revised: 13 June Accepted: 22 June

Index in Cosmos

July 2018 Volume 8 Number 7

UGC approved journal



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Diversification of Crops in Nashik District: A Spatio Temporal Analysis

Dhatrak, Swapnil P.; Jadhav, R. A.

Shanlax International Journal of Education, v7 n1 p9-12 Dec 2018

The Present investigation aims in studying the crop diversification in Nashik District. The present study is based on sundry data collected from different government organizations. The data covers 30 years i.e. from 1980-81 to 2011-12. All the types of crops were considered for the study. In order to study the economics of crop diversification, land concentration was computed for selected years. Talukawise study showed that area under kharif crop has found to be decreased in all the Tehsils of Nashik District. The area under Igatpuri, Trimbakeshwar & Peth have high production of Rice. The diversification from subsistence crop to more commercial crops to more commercial crops were took place in selected Tehsils. In Nashik Districts main horticultural Crops are mango, Pomegranate and Grapes. Because of wine made of Grapes Nashik is known as Wine Capital of India.

Descriptors: [Foreign Countries](#), [Agronomy](#), [Agricultural Production](#), [Economic Factors](#), [Geographic Regions](#), [Agriculture](#)

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 Peer reviewed

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ERIC Number: EJ1245200

Record Type: Journal

Publication Date: 2018-Dec

Pages: 4

Abstractor: As Provided

ISBN: N/A

ISSN: ISSN-2320-2653

EISSN: N/A

Publication Type: Journal Articles; Reports - Research

Education Level: N/A

Audience: N/A

Language: English

Sponsor: N/A

Authoring Institution: N/A

Conservation of Biodiversity in India- A Review

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Introduction:

Before starting the discussion it is necessary to understand the concept of conservation. The word conservation is derived from two Latin words 'con' meaning 'together' and 'server' meaning to 'keep' or guard. Thus the literal meaning of conservation is to keep together. This word was coined by Gifford Pinchot. The term conservation is defined as a sacrifice of the present generation to future generations, whenever it is carried for, this conflict beginning far before the ideal is reached with conservationist are inclined to advocate. Mostly, we hear the term conservation with respect to recourse i.e., resource conservation but here the discussion is with respect to the biodiversity conservation and biodiversity too is a resource. Thus the present note deals with the conservation of biodiversity, its causes and effects. In the past 20 years remarkable progress has been made towards understanding how the loss of biodiversity affects the functioning of ecosystems and thus affects society. Soon after the 1992 Earth Summit in Rio de Janeiro, interest in understanding how biodiversity loss might affect the dynamics and functioning of ecosystems and the supply of goods and services, grew dramatically. Major international research initiatives formed; hundreds of experiments were performed in ecosystems all over the globe; new ecological theories were developed and tested against experimental results. During the 1980s, concern about the rate at which species were being lost from ecosystems led to research showing that organisms can influence the physical formation of habitats, fluxes of elements in biogeochemical cycles, and the productivity of ecosystems. Such research suggested that loss of certain life forms could substantially alter the structure and functioning of whole ecosystems. By the 1990s, several international initiatives were focused on the more specific question of how the diversity of life forms impacts upon ecosystems. The Scientific Committee on Problems of the Environment (SCOPE) produced an influential book reviewing the state of knowledge on biodiversity and ecosystem functioning (BEF). By the mid-1990s, BEF studies had manipulated the species richness of plants in laboratory and field experiments and suggested that ecosystem functions, like biomass production and nutrient cycling, respond strongly to changes in biological diversity.

Biodiversity loss and their causes:

See the irony of the fact that the species are disappearing before even we have named them or determined their possible uses and role in the biosphere, suggest that it is wiser to make serious attempts to conserve them. It is now that the people of the world are realizing that diversity at all level i.e., gene pool, species and biotic community is important and needs to be conserved for sustainable development. The major causes of biodiversity decline are land use changes, pollution, changes in atmospheric CO₂ concentrations, changes in the nitrogen cycle and acid rain, climate alterations, and the introduction of exotic species, all coincident to human population growth. For rainforests, the primary factor is land conversion. Climate will probably change least in tropical regions, and nitrogen problems are not as important because growth in rainforests is usually limited more by low phosphorus levels than by nitrogen insufficiency. The introduction of exotic species is also less of a problem than in temperate areas because there is so

Cross-Curricular Concerns in Geography: Earth Science and Physical Geography

Dr. Pralhad Y. Vyalij

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Abstract:

Geography is traditionally divided into two branches—physical geography and human geography, and it has been argued that one of the key justifications for the place of geography in the curriculum is its position as a bridge between the sciences and the arts. If geography is such a bridge, then one end of the geography bridge will rest on the ground of the sciences. In the past, the relationship between school geography and school science has tended to be reparative, but the development of the National Curriculum has highlighted many of the similarities between the two subjects and provided a platform for reviewing the relationship between science and geography teaching and its implications for pupils in the classroom.

Keywords: *Geography, Earth Sciences, Physical Geography*

Introduction:

What are the Earth sciences and how do they relate to Geography?

The term 'Earth sciences' gained wide usage in North America in the 1960s and became established a decade or so later in Britain. It has been applied to a collection of disciplines encompassing the study of aspects of the physical earth, varying from place to place and from time to time. However, a consensus of what constitutes earth sciences would include climatology, meteorology, economic geology, engineering geology, geochemistry, geomorphology, geophysics, hydrology, mineralogy, oceanography, palaeoclimatology, palaeoecology, palaeogeography, palaeontology, pedology, petrology, planetary geology, sedimentology, stratigraphy, structural geology, tectonics and volcanology.

Most geography teachers will recognize and identify with some of the key aspects just listed and a glance at some of the recent geography A level syllabuses will see several of the Earth science disciplines (e.g. climatology, meteorology, geomorphology, hydrology) appearing as subheadings on the syllabus outline. They constitute, of course, what is known as physical geography, while the others could be grouped under a label of geology.

The origins of physical geography lie in environmental determinism and regional geography, which was the predominant approach to geography for the first half of the twentieth century. Thus no account of the geography of an area would be complete without an initial consideration of the nature and distribution of its rocks, landforms, soils, climate, rivers, minerals and vegetation. At a higher level of study a more detailed investigation was demanded and so developed the specialist subdisciplines of geomorphology, pedology, hydrology, climatology and biogeography, although at school level they remained grouped under the general heading of physical geography.

Physical Geography and Earth Science in the National Curriculum:

Concurrent with these developments in geography teaching, there was a general move in science education toward the introduction of broad and balanced science courses, and these included aspects of Earth science. Science, being designated a core subject, was already in place and being taught in schools when the Geography National Curriculum Working Party was formed. Consequently, this led to a territorial clash over 'ownership' of Earth science and, in their Interim Report produced in late 1989, the Geography Working Party included comments on the 'problems at the interface between science and



‘निश्चलीकरणाचा ग्रामीण आर्थिक व्यवहारांवर झालेल्या परिणामांचा अभ्यास’

प्रा. डॉ. एन. एन. गाढे,

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प्रस्तावना: भारतात 1934 च्या कायद्यान्वये रिझर्व्ह बँक ऑफ इंडियाची स्थापना झाली असून RBI ही देशातील मध्यवर्ती बँक आहे. देशातील चलनविषयक धोरण ठरविण्याचा आणि चलन निर्मितीचा अधिकार RBI ला आहे. रिझर्व्ह बँक ऑफ इंडिया अँक्टच्या कलम 26 (2) रिझर्व्ह बँकेच्या केंद्रीय संचालक मंडळाने सुचविल्यानुसार केंद्र सरकार त्या-त्या विशिष्ट रकमांच्या नोटा चलनातून बाद करण्याचे जाहीर करू शकते. याचाच आधार घेऊन सरकारने 500 व 1000 रुपयांच्या नोटा चलनातून रद्द केल्याचे 8 नोव्हेंबर 2016 रोजी जाहीर केले. या निर्णयाचे भारतीय अर्थव्यवस्थेवर बरे वाईट परिणाम झाले. तसेच ग्रामीण भागातील शेतकरी वर्गावर आणि शेती क्षेत्रावर देखील या निर्णयाचे परिणाम झाले. त्या परिणामांचा मागोवा घेण्याचा प्रयत्न प्रस्तुत शोधनिबंधात करण्यात आलेला आहे.

संशोधनाची उद्दिष्टे

प्रस्तुतच्या शोधनिबंधाची उद्दिष्टे खालीलप्रमाणे निश्चित करण्यात आलेली आहेत.

1. निश्चलीकरण तथा नोटबंदीचा निर्णय योग्य आहे की नाही याविषयी मत जाणून घेणे.
2. निश्चलीकरणामुळे ग्रामीण भागातील दैनंदिन आर्थिक व्यवहारांवर झालेल्या परिणामांचा अभ्यास करणे.
3. निश्चलीकरणामुळे ग्रामीण भागातील रोखतेवर झालेल्या परिणामांची माहिती मिळविणे.
4. निश्चलीकरणामुळे शेतमालाच्या दरावर झालेले परिणाम अभ्यासणे.
5. निश्चलीकरणामुळे बँकिंग व्यवहार करताना शेतकऱ्यांना सहन कराव्या लागलेल्या त्रासाबद्दल माहिती मिळविणे.
6. निश्चलीकरणामुळे भ्रष्टाचार कमी होण्यास मदत होईल काय याविषयी लोकांची मते जाणून घेणे.

संशोधन कार्यपद्धती

प्रस्तुत संशोधनासाठी सर्वेक्षण पद्धतीचा अवलंब करण्यात आलेला आहे. त्यासाठी वर्णनात्मक संशोधन पद्धती वापरलेली आहे. प्रस्तुत संशोधनासाठी प्राथमिक व दुय्यम साधन सामग्रीचा समन्वयात्मक आधार घेण्यात आलेला आहे.

नमुना निवड

प्रस्तुत अभ्यासासाठी महाराष्ट्र राज्यातील नाशिक जिल्ह्यातील नांदगाव तालुका आणि चांदवड तालुका या भौगोलिक क्षेत्रातील एकूण 20 गावांची निवड करण्यात आलेली आहे. नांदगाव तालुक्यातून कऱ्ही, धनेर, धोटाणे, कोंढार, खादगाव, एकवई, नागापूर, बोयगाव, मनमाड, अनकवाडे या दहा गावांची तर चांदवड तालुक्यातून निमोण, कानडगाव, मेसनखेडे, वागदडी, कुंदलगाव, दरेगाव, अस्तगाव, भडाणे, दहेगाव, दुगाव या दहा गावांची निवड करण्यात आलेली आहे. म्हणजेच दोन्ही तालुक्यातून एकूण 20 गावे निवडून प्रत्येक गावातील 10 शेतकरी म्हणजेच एकूण 200 शेतकऱ्यांची नमुना निवड केलेली आहे. त्या शेतकऱ्यांकडून प्रश्नावली व मुलाखतीच्या साहाय्याने माहिती संकलित केलेली आहे.

दिनांक 9 नोव्हेंबर 2016 ते 28 डिसेंबर 2016 या पन्नास दिवसांच्या कालावधीत माहितीचे संकलन केलेले आहे. सदरच्या कालावधीत नोटबंदी घोषित केल्यामुळे त्याचे विविध क्षेत्रांवर व विविध समुदायांवर अनेकविध परिणाम झाले. तीव्र चलन तुटवडा, बँका व ए. टी. एम. समोर लागलेल्या लोकांच्या मोठ-मोठ्या रांगा, लोकांना सहन करावा लागलेला मनस्ताप इत्यादी गोष्टी मोठ्या प्रमाणावर जाणवल्या म्हणून संशोधनासाठी या कालावधीची निवड करण्यात आली आहे.



Dr. B. R. Ambedkar's Views and Ideas on Education

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Abstract :

Education is the fourth necessity for man after food, clothing and shelter in the modern world. It is considered as a powerful weapon for bringing desirable social changes and progress. Dr. Ambedkar recognized the importance and power of education. He compares education with the milk of the tigress and adds that, who will drink it, it won't seat calm. Dr. Ambedkar had great respect and belief towards education. He insists that everyone must get opportunity of education. According to him education should be based on rationality. He says that purpose of education is to moralize and socialize the people. Dr. Ambedkar suggested the way of upliftment of depressed classes was through education. His emphasis on education advocated an educational system which served all. He supported education that inculcates human rights education, education that teaches human dignity and justice. Dr. Ambedkar not only discusses primary education but also higher education. He emphasizes compulsory and free education for all.

Key words: - Depressed Class, Primary Education, Higher Education, Educate, Agitate, Organize

Introduction:

Dr. Ambedkar's contribution to economics, political science, Anthropology, Sociology, History, Law, Education and National Security is noteworthy, considerable and magnificent. He was one of the modern thinkers and the nation builder of India. Dr. Ambedkar has enlightened the path of national integrity and development which lies in the education which is the important pillar of the nation. He says, 'without education we cannot develop the society and human beings.' 'The main purpose of the education is that, it creates self confidence among people.' Dr. Ambedkar says that, 'the work without knowledge is blind and futile.' His educational ideas and views are a reaction to the social structure of the time he lived. His philosophy of education was seen through his practice in his lifetime.

Research Methodology

This Paper aims to discuss the views and ideas on education with reference to Dr. B. R. Ambedkar. It is mainly descriptive in nature. Information and Data about the paper has been collected from various secondary sources such as websites, books, journals, research articles and reports.

Dr. Ambedkar's Education - Dr. Ambedkar is the recipient M.A., Ph.D., M. Sc., D.Sc., Bar-at-law, L.L.D., D.Litt. such high degrees. He proved that we can change our worst situation by using the weapon of education. He established various educational institutes in Maharashtra

Dr. Narayan N. Gadhe (1545-1547)

DEMNETIZATION AND CASHLESS TRANSACTIONS

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Abstract

The digital India program is a flagship program of the government with a vision to transform India into digitally empowered society. Cashless India is a mission launched by the Government of India led by Prime Minister Narendra Modi. On November 8, 2016 the government announced a historic measure of demonetization notes, Rs. 500 and Rs. 1000 and push India towards cashless economy. It leads to sudden boom in cashless transactions. Demonetization really affected the cash transactions because of lack of sufficient number of low demonetization rupee notes in banks and ATMs for a short while. The shortage of currency leads to increases the cashless transactions. Digital payment soars by up to 300% after demonetization. This paper analyzes the basic concept of cashless transaction. It is also discusses the different e-payment methods, It is also describe advantages and disadvantages of the cashless transaction.

Introduction- Cashless transactions mean all transactions are done without using cash. In such situation all transactions are carried out through electronic devises. Its includes e-banking, mobile banking, banking through internet, use of debit and credit cards, NEFT and RTGS card-swipe machines and digital wallets etc. Today, cashless transactions through electronic devices become popular in urban areas. India is the fourth-largest user of cash in the globe. In India the rate of cash to GDP is the highest, i.e. 12.42%. Cash transaction leads to corruption and black money. Therefore India needed cashless economy. Recently Word Bank report indicates that 80% of the transactions in India were done in cash mode, which formed two-third of the value of the total transactions. Demonetization really affected the cash transactions. Cashless India is a mission launched by the Government of India. Government announced on November 8, 2016 a historic measure of demonetization of high value currency notes, Rs. 500 and Rs. 1000. That pushes India towards cashless economy. It leads to sudden boom in cashless transactions. Demonetization pushes India towards cashless economy. The shortage of currency leads to increases the cashless transactions. In the month after demonetization, the volume of transactions through mobile wallets increases fourfold to 63 lakhs per day, totaling Rs. 191 crore. While the number of transactions through RuPay cards increased nearly four times to 60 lakhs per day and the value jumped near about to 236 crore.

Objectives

1. To explain the concept of cashless economy.
2. To discuss the different methods of e-payment.
3. To describe the advantages and disadvantages of cashless transactions.

Methodology: The study purely based on secondary data. The required data has been collected through various books, journals, websites and news papers. The study is descriptive in nature.

Meaning of Cashless Economy: Cashless Economy is a situation in which all types of transactions are carried out through electronic devises. Its includes e-banking, mobile banking, banking through internet, use of debit and credit cards, card-swipe machines and digital wallets etc. Cashless economy indicates reducing the use of physical cash for payment. Instead of handling cash, payments are made to settle digitally, through e-payment.

Methods of e-payment: Indian government, after demonetization, has been encouraging people to use cashless digital payments methods for any kind of payments. The government has started several initiatives for making the country cashless, such as 'Jan Dhan to Digidhan' and 'Mera Mobile-Mera Wallet' and Cashless India.



RETAIL MARKETING IN RURAL INDIA: SCOPE AND CHALLENGES

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Introduction

The Indian retail industry is one of the fastest growing in the world. It is expected to grow to \$ 111.25 billion by 2019 from \$ 70.45 billion in 2016. India is the fifth largest destination in the world in terms of retail marketing. It's recorded 10% growth rate annually. This sector is one of the major contributors in the term of employment. It provides 8% of the employment. By 2018, retail sector in India is likely to 13% growth at a compound average growth rate. India is the highest in the world in terms of per capita retail store availability. Damien Veilleroy, the Head Asia Metro AG said that, India is becoming a very important market and in terms of investment, it will be one of the countries where we will invest the most in the future. This statement clear that, India is the best destination for FDI. It has a bright future of retail sector. Indian Government has introduced the reforms related to the retail marketing in 2012. It allows the foreign direct investment in retail industry. Indian Government has approved 51% FDI in multi-brand retail and increased FDI limit to 100% in single brand retail.

Rural India accounts more than 2/5 of the total consumption of the country. Several players already start their business in rural area. There is a tremendous scope of retailing in villages in the country. Because of 70% population resides in rural India.

Objectives of the study

This paper is an attempt to understand the concept of retailing and explain the scope of rural retailing in India. It gives the brief information about the growth of retail sector in the country. It is also provides the information about the challenges in rural retailing.

Research Methodology

The present study is purely based on secondary data. Research articles and reference texts studied to define meaning and scope of the concept. Online survey reports of the various professionals, agencies and researchers are referred to the study of scope of retailing. Whereas report of the Government and other national, International agencies have been studied to obtain statistical data. The required data also collected from the various websites. Descriptive and analytical research method has been used.

Concept of Retailing

Retailing consists of the sale of goods for personal or household consumption either for a fixed location such as a departmental store or kiosk, are away from a fixed location and related subordinate services. A retailer buys goods in large quantities from manufacturer or a wholesaler and then sales small quantities to the customers.

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Abstract:

The Goods and Service Tax is one of the biggest reforms in the field of indirect taxes in India since independence. GST has replaced many indirect taxes previously existed in India into a single tax. The previous indirect tax structure is very complex as compare to the new tax system. Previously there were so many taxes levied by the central and state governments on goods and services. Goods and Service tax is an indirect tax levied on the supply of goods and services. It is a comprehensive tax. It is a multistage tax system means GST levied on every value addition. GST was introduced in India on 1st July 2017. It is governed by a GST Council. GST reforms expected to bring a lot of changes in Indian economy. In this paper an attempt to explain the need of GST in Indian economy. It will be boost to the economy in near future.

Keywords: Goods and Service Tax, Components, Rates, Needs, Advantages, Disadvantages.

Introduction

The Goods and Service tax is an indirect tax levied on the supply of goods and services. The previous indirect tax structure is complex. In a pre-GST regime there were many taxes imposed by the central and state governments on goods and services. With GST implementation near about seventeen indirect taxes subsumed. Indian government opted dual system GST, it means that GST collected and levied by the Central and State government. GST unified one national market across the country. GST will definitely beneficial for Indian economy in long term. It is need to implement such tax in India. All businesses are impacted by GST.

Objectives of the study

This paper is an attempt to understand the new tax system. It is also gives the brief information about the rates, components and the need of GST, This paper is try to explain the difference between previous tax structure and new tax system. It is also describe the benefits of GST and loopholes in GST.

Research Methodology

This paper is descriptive in nature. It is based on secondary data. Data has been collected through various books, journals, news papers and websites.

What is GST?

Goods and Service Tax is basically a tax policy that brought uniform market all around the country. GST reduced the complicated structure of taxation as it created a common market. This was also reducing the burden of tax payer and abolished the cascading effects of taxes.



Types of Research and the Importance of Computers in Research

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Abstract

Many research studies related to social sciences are undertaken nowadays, but in most cases very little attention is paid to an important aspect relating to research, i.e. research methodology. The need therefore, is for those concerned with research has to pay due attention to design and adhere the appropriate methodology throughout for improving the quality of research. The methodology may differ, but the basic approach towards research remains the same.

We can say this is the computer era. Computer performs many functions with speed and accuracy. Today, life has become impossible without computers. Computer are used in school, colleges, business and also in other activities. People use computers in almost every walk of life. Research is also an area where computers are playing significant role. Today computer is a necessary part of research. With computer the research task became easier, faster and accurate.

Keywords: Computer, Research, Methodology.

Introduction

Research is an art of scientific investigation. It is the systematic approach towards purposeful investigation. Some people consider research as a movement from the known to the unknown. It is actually a voyage of discovery. Research is an academic activity and a systematized effort to gain new knowledge. Research comprises defining and redefining problems, formulating hypothesis, collection of data, on relevant variables, analyzing and interpreting the results and reaching conclusions either in the form of solution or certain generalizations. In short the term 'research' refers to the systematic method of finding solution to the problem. The objective of research is to find out answers to questions through the application of systematic and scientific way.

Today computer is a necessary part of research. We can say this is the computer era. People use computers in almost every walk of life. With computer the research task became easier, faster and accurate.

Objectives of the study

This paper is an attempt to describe the various types of research. It gives the brief information about the significance of computer in research. It is also gives certain suggestions for the qualitative research.

Research Methodology

This paper is descriptive in nature. It is based on secondary data. Data has been collected from various books and websites.

Types of research

The basic types of research are as follows. Every types of research computer play an important role for analyzing data.



भारतातील वस्तू व सेवा कराचे भवितव्य

प्रा. डॉ. ना. ना. गाढे,

लोकनेते व्यंकटराव हिरे कला, विज्ञान, आणि वाणिज्य महाविद्यालय पंचवटी, नाशिक

प्रस्तावना :

भारतात करांचे वर्गीकरण दोन प्रकारात केले जाते. एक म्हणजे प्रत्यक्ष कर आणि दुसरे अप्रत्यक्ष कर होत. अप्रत्यक्ष कर हे वस्तू व सेवांवर आकारले जातात. वस्तू व सेवा कर हा अप्रत्यक्ष कर आहे. भारतात गेल्या काही वर्षांपासून अप्रत्यक्ष कर सुधारणा विधेयक संमत व्हावे म्हणून प्रयत्न सुरू होते. संपूर्ण देशात जीएसटीविषयी चर्चा, विचारमंथन, वादविवाद, सहमती, असहमती असे अनेक अडथळे पार करत शेवटी वस्तू व सेवा कर कायदा सुधारणा विधेयक लोकसभा व राज्यसभेने मंजूर केले आणि १ जुलै २०१७ पासून देशभरात जीएसटीची अंमलबजावणी सुरू झाली. 'वन नेशन वन टॅक्स' या संकल्पनेवर जीएसटी आधारित आहे. जीएसटी मुळे एक देश, एक कर, एक बाजार ही कर प्रणाली अस्तित्वात आली आहे. स्वातंत्र्योत्तर काळातील अप्रत्यक्ष कर प्रणालीमधील हा सर्वात महत्त्वाचा आणि मोठा बदल आहे. संपूर्ण देशात अप्रत्यक्ष कराची एकच पारदर्शक पद्धत हा वस्तू व सेवा कर प्रणालीचा मूळ गाभा आहे. जीएसटी कायदा हा व्यावसायिकांच्या सर्व पुरवठा साखळीमध्ये आमूलाग्र बदल आणणारा कायदा आहे. भारतात जीएसटी येण्यापूर्वी अप्रत्यक्ष कर पद्धती अत्यंत क्लिष्ट, गुंतागुंतीची व करांवर कर अशी होती. जीएसटीमुळे करपद्धती सुटसुटीत व पारदर्शक होण्यास मदत झाली आहे. जीएसटीचे भवितव्य खूप चांगले असणार आहे. भविष्यात सर्व वस्तूंवर एकाच दराने कर आकारणी होईल अशी शक्यता असून जीएसटीचा दर किमान पातळीवर राहील.

शोध निबंधाची उद्दिष्टे:

प्रस्तुत शोधनिबंधाची उद्दिष्टे पुढीलप्रमाणे निश्चित करण्यात आलेली आहेत.

१. वस्तू व सेवा कर लागू होण्यापूर्वीच्या भारतातील कर प्रणालीचा अभ्यास करणे.
२. भारतातील वस्तू व सेवा कराचा प्रवास माहित करून घेणे.
३. वस्तू व सेवा कराची वैशिष्ट्ये अभ्यासणे.
४. वस्तू व सेवा कर कायदातील महत्त्वाची कलमे जाणून घेणे.
५. वस्तू व सेवा करातील अलिकडील काळात केल्या गेलेल्या बदलांचा आढावा घेणे.
६. वस्तू व सेवा कराचे भवितव्य विचारात घेणे.

संशोधन पद्धती

प्रस्तुत शोध निबंधासाठी विश्लेषणात्मक संशोधन पद्धतीचा अवलंब केलेला आहे. शोध निबंधाच्या पूर्णत्वासाठी द्वितीय स्रोतांचा वापर करण्यात आलेला आहे. संदर्भ ग्रंथ, मासिके आणि इंटरनेट इत्यादींच्या माध्यमातून माहिती मिळविण्यात आलेली आहे.

वस्तू व सेवा कर लागू होण्यापूर्वीची भारतातील करप्रणाली:

१ जुलै २०१७ पूर्वी भारतात जी अप्रत्यक्ष कर प्रणाली अस्तित्वात होती त्यामध्ये केंद्र सरकारद्वारा व राज्य सरकारद्वारा आकारण्यात येणाऱ्या विविध प्रकारच्या अप्रत्यक्ष करांचा समावेश होता. त्यामध्ये केंद्राच्या अखत्यारीतील प्राप्तीकर, निगमकर, उत्पादन शुल्क, आयात-निर्यात कर, केंद्रीय विक्रीकर इत्यादी तर राज्य राज्य सरकारांकडून आकारण्यात येणारे नागरी जमीन महसूल, राजस्व व नोंदणी कर, मालमत्ता कर, व्यवसाय कर, वीज कर, वाहन कर, इंधन कर, करमणूक कर, विक्री कर, अबकारी कर इत्यादी अप्रत्यक्ष करांचा समावेश होता. या करांशिवाय स्थानिक स्वराज्य संस्थांचे कर वेगळे होते. तसेच करांवर कर आकारले जात होते. अशी अत्यंत क्लिष्ट, गुंतागुंतीची, वेळखाऊ कर प्रणाली अस्तित्वात होती. ती कर प्रणाली एक प्रकारे विकास प्रक्रियेला खीळ घालणारी अशी होती. अशा कर पद्धतीचा परिणाम म्हणून देशात भाववाढीला चालना मिळत होती. करदात्यांना नेमका किती कर भरावा लागत होता हे समजत नव्हते. पूर्वीच्या कर पद्धतीमुळे गैरकारभार, करचुकवेगीरी, भ्रष्टाचार,



INTERNATIONAL RESEARCH JOURNAL OF MULTIDISCIPLINARY
STUDIES
SPECIAL ISSUE ON TRIBAL DISCOURSE- MULTIDISCIPLINARY
APPROACH

Vol. 4, Special Issue 1, January, 2018 | ISSN (Online): 2454-8499 | Impact Factor: 1.3599(GIF),
0.679(IIFS)

सुरगाणा तालुक्यातील आदिवासींच्या स्थलांतराचे अध्ययन

डॉ. नारायण नामदेव गाढे,

सहयोगी प्राध्यापक, लोकनेते व्यंकटराव हिरे कला, विज्ञान आणि वाणिज्य महाविद्यालय, पंचवटी, नाशिक
प्रास्ताविक

महाराष्ट्र राज्याच्या सात महसूल विभागांपैकी नाशिक विभागात आदिवासींचे प्रमाण सर्वाधिक असून सन 2011 च्या जनगणनेनुसार ते 25.6 टक्के एवढे आहे. महाराष्ट्र राज्यातील नाशिक जिल्ह्यातील 15 तालुक्यांपैकी सुरगाणा, पेठ, इगतपुरी, त्र्यंबकेश्वर, कळवण, दिंडोरी इत्यादी तालुक्यांमध्ये आदिवासींचे वास्तव्य अधिक प्रमाणात आढळते. त्यापैकी सुरगाणा हा एक आदिवासीबहुल तालुका आहे. सन 2011 च्या जनगणनेनुसार सुरगाणा तालुक्याची एकूण लोकसंख्या 1,75,816 एवढी असून त्यापैकी 1,69,688 एवढी म्हणजेच 96.5 टक्के लोकसंख्या अनुसूचित जमातीची होती. आदिवासी जमातींची आर्थिक परिस्थिती अत्यंत हलाखीलची असल्यामुळे आणि स्थानिक ठिकाणी रोजगाराच्या संधीचा अभाव असल्यामुळे सुरगाणा तालुक्यातील आदिवासींचे तात्पुरत्या कालावधीसाठी मोठ्या प्रमाणावर स्थलांतर होत असल्याचे दिसून आले आहे.

शोधनिबंधाची उद्दिष्ट्ये

प्रस्तुत शोधनिबंधासाठी खालील उद्दिष्ट्ये निश्चित करण्यात आलेली आहेत.

1. भारतातील आदिवासींबाबत महत्त्वाची तथ्ये माहित करून घेणे.
2. महाराष्ट्रातील आदिवासी जमाती माहित करून घेणे.
3. आदिवासी अर्थव्यवस्थेची वैशिष्ट्ये जाणून घेणे.
4. अभ्यास क्षेत्रातील आदिवासींच्या स्थलांतराचे स्वरूप समजावून घेणे
5. अध्ययन क्षेत्रातील आदिवासींच्या स्थलांतराच्या कारणांचे अध्ययन करणे.
6. अभ्यास क्षेत्रातील आदिवासींच्या स्थलांतराचे परिणाम अभ्यासणे.
7. निष्कर्ष प्रस्तुत करणे.

संशोधन पद्धती

प्रस्तुत शोधनिबंधाच्या पूर्णत्वासाठी विश्लेषणात्मक संशोधन पद्धतीचा अवलंब केलेला आहे. तथ्यांचे संकलन करण्यासाठी प्राथमिक आणि दुय्यम अशा दोन्ही स्त्रोतांचा आधार घेण्यात आलेला आहे. आलेला आहे. तथ्य संकलनासाठी प्रश्नावली व मुलाखत या तंत्रांचा अवलंब केलेला आहे.

नमुना निवड

सुरगाणा तालुक्यातील एकूण गावांची संख्या 190 एवढी असून प्रस्तुत अभ्यासासाठी पाच गावांची निवड करण्यात आलेली आहे. ती गावे पुढीलप्रमाणे आहेत. उंबरपाडा, माणी, हट्टी,



वस्तू व सेवा कराचे फायदे आणि त्यातील उणिवा

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प्रस्तावना

भारतात सरकारला राज्यघटनेतील कलम 265 अंतर्गत करारोपण करण्याचा अधिकार देण्यात आलेला आहे. कर हे सक्तीचे देणे असते. डॉ डॅल्टन यांनी म्हटल्याप्रमाणे, 'ज्या व्यक्तीवर कर लादले आहेत त्याच व्यक्तींकडून ते कर पूर्णपणे भरले जातात असे कर म्हणजे प्रत्यक्ष कर होत.' प्रत्यक्ष कराचा कराघात व करभार एकाच व्यक्तीवर पडतो. प्रत्यक्ष कर दुसऱ्यावर ढकलता येत नाहीत. 'अप्रत्यक्ष कर म्हणजे असे कर की, ज्याचा भार दुसऱ्यावर ढकलता येतो. याचाच अर्थ अप्रत्यक्ष करांच्या बाबतीत कराघात एका व्यक्तीवर व करभार मात्र दुसऱ्या व्यक्तीवर पडत असतो. कर भरण्याची कायदेशीर जबाबदारी एका व्यक्तीची असते, मात्र त्या कराचा भार दुसऱ्यावर ढकलला जातो.' अप्रत्यक्ष कर हे वस्तू व सेवांवर आकारले जातात. वस्तू व सेवा कर (जीएसटी) हा अप्रत्यक्ष कर आहे. देशात क्रेंद्राचे 8 अप्रत्यक्ष कर आणि राज्याचे 9 अप्रत्यक्ष कर असे एकूण 17 अप्रत्यक्ष कर संपुष्टात आणले गेले आणि त्याऐवजी एकच 'वस्तू व सेवा कर' म्हणजेच 'जीएसटी' हा कर लागू करण्यात आला. 1 जुलै 2017 पासून देशभरात जीएसटीची अंमलबजावणी सुरु झाली. जीएसटी करप्रणाली ही 'एक देश, एक कर, एक बाजारपेठ' या संकल्पनेवर आधारित आहे. स्वातंत्र्योत्तर काळातील अप्रत्यक्ष कर सुधारणेतील हा सर्वात महत्वाचा बदल आहे. जीएसटीमुळे अर्थव्यवस्थेतील विविध घटकाना फायदे झालेले दिसून येत असले तरी जीएसटी कायद्यात व अंमलबजावणीत अजूनही अनेक त्रुटी तथा उणिवा आहेत. त्या उणिवा दूर करणे आवश्यक आहे.

शोधनिबंधाची उद्दिष्ट्ये

प्रस्तुत शोधनिबंधाची उद्दिष्ट्ये खालीलप्रमाणे निश्चित करण्यात आलेली आहेत.

- 1) वस्तू व सेवा कराची वैशिष्ट्ये अभ्यासणे.
- 2) भारतातील अलीकडील काळातील कर सुधारणांचा आढावा घेणे.
- 3) वस्तू व सेवा कराच्या स्वरूपाचा अभ्यास करणे.
- 4) वस्तू व सेवा कराचे फायदे अभ्यासणे.
- 5) वस्तू व सेवा करातील उणिवा तथा त्रुटींचा अभ्यास करणे.
- 6) जीएसटी अधिक परिणामकारक होण्यासाठी काय केले पाहिजे यासंबंधी उपाययोजना सुचविणे.

संशोधन पद्धती

प्रस्तुत शोधनिबंधाच्या पूर्णत्वाकरिता वर्णनात्मक व विश्लेषणात्मक संशोधन पद्धती अवलंबलेली असून दुय्यम स्रोतांचा आधार घेण्यात आलेला आहे. त्यामध्ये प्रामुख्याने संदर्भ ग्रंथ, मासिके, इंटरनेट, वर्तमानपत्र इत्यादींचा अवलंब करण्यात आलेला आहे.

भारतातील अलीकडील काळातील करविषयक सुधारणा

भारत सरकारने अलीकडील काळात कर रचनेत अनेक सुधारणा केलेल्या आहेत. त्याचा थोडक्यात आढावा पुढीलप्रमाणे घेता येईल.

DEMONETIZATION AND ITS IMPACT ON AGRICULTURE

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Abstract

Agriculture plays a vital role in economic development of the country. It is the backbone of Indian economy. Over 58 per cent of the rural households depend on agriculture as their principal means of livelihood. It is main source of employment. Agriculture sector in India contributes to the GDP is about 17.9 per cent (2014). The decision of demonetization has affected the agriculture directly in four ways. This include area sown, crop pattern, sale and market. In rural India there is a lack of banking services. Indian agriculture is dominated by cash based transactions which created more difficulties for the rural people specially farmers. Due to the cash crunch farmers faces the difficulties to buy the inputs for agriculture; like seeds, fertilizers, pesticides etc. Demonetization greatly affects the agriculture sector. This study threw light on impact of demonetization on Indian agriculture sector.

Key words: Demonetization, Agriculture
Introduction

Agriculture plays a significant role in economic development of India. It is the backbone of the economy. Over 58 per cent of the rural population depends on agriculture as their main means of livelihood. It is important source of employment. Agriculture sector in India contributes to the GDP is about 17.9 per cent (2014).

The Government of India led by Prime Minister Narendra Modi on November 8, 2016 unexpectedly announced that the Rs. 500 and Rs. 1000 notes would be demonetized, it means those notes would not be accepted as legal tender. Demonetization really affected the cash transactions because of lack of sufficient number of low demonetization rupee notes in banks and ATMs for a short while. India is the fourth-largest user of cash in the globe. In India the rate of cash to GDP is the highest, i.e. 12.42%. Recently Word Bank report indicates that 80% of the transactions in India were done in cash mode, which formed two-third of the value of the total transactions. The shortage of cash really affects the rural transaction especially regarding agriculture sector. The decision of demonetization has affected the agriculture directly in four ways. This includes area sown, crop pattern, sales and market.

Objectives

Following are the main objectives of the study.

1. To review the history of demonetization in India
2. To identify the reasons behind demonetization.
3. To discuss the effects of demonetization on agriculture.

Methodology

The study is explanatory in nature and based on secondary data. The required data has been collected from various books, journals, websites and news papers.

Reasons behind Demonetization in India

Government gives the following reasons of demonetization

- 1) To reduce black money from the economy.
- 2) To broke down the terrorism funding.
- 3) To eliminate corruption.
- 4) To increase the cashless transactions.

History of Demonetization in India

Demonetization is not new to India. It happened twice before the current demonetization in 1946 and 1978. In the year

समावेशी वृद्धी आणि आदिवासी जमाती

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प्रास्ताविक

अलिकडच्या काळात आर्थिक विकासाच्या संदर्भात Inclusive Growth अर्थात समावेशी वृद्धीची संकल्पना चर्चिली जात आहे. ही संकल्पना आर्थिक विकासाची फळे तळागाळातील लोकांपर्यंत पोहचविणे आणि सर्व समाज घटकांना समान संधी या न्यायावर आधारलेली आहे. त्यातूनच आदिवासी जमातीना देशाच्या मुख्य प्रवाहात आणण्याच्या दृष्टीने प्रयत्न केले जात आहेत. परंतु खऱ्या अर्थाने आदिवासी हा समाज घटक अजूनही देशाच्या मुख्य प्रवाहापासून दूर राहिलेला असल्याचे दिसून येते. जोपर्यंत देशातील वंचित, आदिवासी, दलित, महिला या समाज घटकांना मुख्य प्रवाहात सामावून घेतले जाणार नाही, त्यांची प्रगती होणार नाही तोपर्यंत खऱ्या अर्थाने देशाचा आर्थिक विकास होणार नाही आणि समावेशी वृद्धी ही प्रक्रिया साध्य होणार नाही.

देशाच्या सामाजिक प्रगतीचे मोजमाप करण्यासाठी अगदी अलिकडील काळात म्हणजेच २०१३ पासून जागतिक पातळीवर सामाजिक प्रगतीचा निर्देशांक ही संकल्पना वापरली जावू लागली आहे. जगाच्या तुलनेत भारतातील दलित आणि आदिवासींचा मानव विकास निर्देशांक जर पडताळून पाहिला तर तो भारताच्या विद्यमान स्वरूपाच्या सामाजिक आर्थिक विशमतेवर प्रकाश टाकतो. सामाजिक प्रगतीच्या निर्देशांकात जगातील ११३ देशांमध्ये भारताचा ९८ वा क्रमांक लागतो व त्याचा निर्देशांक ५३.९२ इतका आहे.

प्रा. अमर्त्य सेन आणि जीन ड्रेझ यांनी लिहिलेल्या An Uncertain Glory- India and its Contradiction या पुस्तकात भारताच्या गेल्या २० वर्षांतील आर्थिक प्रगतीचा आढावा घेताना सामाजिक परिस्थितीत भारत किती मागास राहिलेला आहे याबाबतचा जो विरोधाभास रेखाटलेला आहे, तो देशातील उपेक्षित, वंचित व आदिवासींचा विकास करण्यासाठी अजूनही किती मोठी मजल मारावयाची आहे यावर भाष्य करतो. संयुक्त राष्ट्र विकास कार्यक्रमाने ;नवव्या २४ जुलै २०१४ रोजी प्रस्तुत केलेल्या मानव विकास अहवालात असे म्हटले आहे की, दलित, आदिवासी, महिला, व अल्पभूधारक शेतकऱ्यांचा असुरक्षित आघातग्रस्त मानव समूह म्हणून विचार केला जावा. ही बाब आदिवासींच्या सर्वसमावेशकतेवर प्रश्न चिन्ह निर्माण करते.



Goods and Service Tax : Challenges and Opportunities

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Abstract:

Goods and Service Tax, a historic tax reform has come in to effect from July 1st 2017. It is the biggest tax reform in India since independence. GST replace all indirect taxes levied on goods and services by the central and state governments. GST unified one national market across the country. It is a comprehensive tax. It is a multistage tax system means GST levied on every value addition. GST is governed by a GST Council

Present paper highlights the challenges and opportunities of GST. It is also focused on the economic implications of GST and recent changes in the rates of GST.

Keywords: Goods and Service Tax

Introduction

Tax policy plays a vital role in the development of the economy. There are two types of taxes in India i.e. Direct taxes and indirect taxes. Goods and Service Tax is popularly known as GST. India has introduced GST with effect from 1st July 2017. GST is an indirect tax levied on the supply of goods and services, right from the manufacturer to the consumer. The previous indirect tax structure is complex. In a pre-GST regime there were many taxes imposed by the central and state governments on goods and services. GST unified one national market across the country. It is a comprehensive tax. It is a multistage tax system means GST levied on every value addition. GST is governed by a GST Council. GST reforms expected to bring a lot of changes in Indian economy.

Objectives of the study

The objectives of the study are as follows.

- To study the salient features of GST.
- To identify the needs of GST in India.
- To know the revised rates of GST.
- To understand the economic implications of GST.
- To acquainted with the challenges of GST.
- To understand the opportunities of GST

Research Methodology

This paper is descriptive in nature. It is based on secondary data; it has been collected from various books, journals, news papers and websites.

What is GST?

Goods and Service Tax is basically a tax policy that brought uniform market all around the country. GST reduced the complicated structure of taxation as it created a common market. This was also reducing the burden of tax payer and abolished the cascading effects of taxes.

वस्तू व सेवा कराचा (GST) भारतीय अर्थव्यवस्थेवरील परिणाम

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भारतात करांचे प्रमुख दोन प्रकार आहेत. एक म्हणजे प्रत्यक्ष कर आणि दुसरा म्हणजे अप्रत्यक्ष कर. प्रत्यक्ष कर हे व्यक्ती व संस्थांच्या उत्पन्नावर तथा मालमत्तेवर आकारले जातात. प्रत्यक्ष करांचा करार व कराघात एकाच व्यक्तीवर पडतो. प्रत्यक्ष कर दुसऱ्यावर ढकलता येत नाहीत. अप्रत्यक्ष करांचा करार मात्र एका व्यक्तीवर आणि कराघात दुसऱ्या व्यक्तीवर पडत असतो. याचाच अर्थ अप्रत्यक्ष कर दुसऱ्यावर ढकलता येतात. अप्रत्यक्ष कर हे वस्तू व सेवांवर आकारले जातात. वस्तू व सेवा कर (जीएसटी) हा अप्रत्यक्ष कर आहे. गेल्या काही वर्षांपासून अप्रत्यक्ष कर सुधारणा विधेयक संमत व्हावे यासाठी प्रयत्न सुरू होते. संपूर्ण देशात जीएसटी विषयी चर्चा, वादविवाद सुरू होते. असे अनेक अडथळे पार करत शेवटी वस्तू व सेवा कर कायदा सुधारणा विधेयक लोकसभा व राज्यसभेत मंजूर केले गेले आणि 1 जुलै 2017 पासून देशभरात जीएसटीची अंमलबजावणी सुरू झाली. जीएसटी करप्रणाली ही 'वन नेशन वन टॅक्स' या संकल्पनेवर आधारित आहे. जीएसटीमुळे एक देश, एक कर, एक बाजार ही करप्रणाली अस्तित्वात आली आहे. स्वातंत्र्योत्तर काळातील अप्रत्यक्ष करप्रणालीतील हा सर्वात मोठा व महत्त्वाचा बदल आहे. जीएसटीमुळे नव्या भारताची बांधणी होणार आहे, असे मानले जात आहे. संपूर्ण देशात अप्रत्यक्ष कराची एकच पारदर्शक पद्धत हा वस्तू व सेवा करप्रणालीचा मूळ गाभा आहे. जीएसटी कायदा हा व्यावसायिकांच्या सर्व पुरवठा साखळीमध्ये आमूलाग्र बदल आणणारा कायदा आहे. जीएसटीचे अर्थव्यवस्थेवर विविध प्रकारचे परिणाम झालेले दिसून येत आहेत. त्याचाच आढावा या अभ्यासात घेण्यात आलेला आहे.

शोधनिबंधाची उद्दिष्ट्ये

प्रस्तुत शोधनिबंधाची उद्दिष्ट्ये खालीलप्रमाणे निश्चित करण्यात आलेली आहेत.

- 1) वस्तू व सेवा कर म्हणजेच जीएसटी ची संकल्पना प्राथमिक स्वरूपात स्पष्ट करणे.
- 2) वस्तू व सेवा कर लागू होण्यापूर्वीची भारतातील करप्रणाली समजावून घेणे.
- 3) वस्तू व सेवा कराची वैशिष्ट्ये अभ्यासणे.
- 4) वस्तू व सेवा कराचे (GST) दर माहित करून घेणे.
- 5) वस्तू व सेवा कराचे भारतीय अर्थव्यवस्थेवरील परिणाम अभ्यासणे.
- 6) जीएसटी अधिक परिणामकारक होण्यासाठी उपाययोजना सुचविणे.

शोधन पद्धती

प्रस्तुत शोधनिबंधाच्या पूर्णत्वाकरिता वर्णनात्मक संशोधन पद्धती अवलंबलेली आहे. सदर शोधनिबंध दुय्यम आधार सामग्रीवर आधारलेला आहे. द्वितीयक स्रोतांमध्ये प्रामुख्याने संदर्भ ग्रंथ, मासिके, वर्तमानपत्र, इंटरनेट इत्यादींचा वापर करण्यात आलेला आहे.

GST म्हणजे काय?

जीएसटी हा अप्रत्यक्ष कर आहे. जीएसटी पद्धतीमध्ये मालाच्या उत्पादनावर कर लावला जात असून पुरवठ्यावर कर लावला जातो. प्रत्येक पुढील पुरवठ्याच्या मूल्यवर्धनावर कर लावण्यात येतो.



Impact of GST on Various Sectors in Indian Economy

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Abstract:

France was the first country to introduce Goods and Service Tax in 1954. After that countries like Japan, South Korea, UK Australia, implemented GST. Congo, Gambia and Malaysia are also adopting GST tax system. Presently there are 160 countries rollout GST in their economies. With the 101st Constitutional Amendment Act come into force on 8th September, 2016 and notification of GST Council on 15th September, 2016 the road to GST in India rollout is clear. India has introduced GST with effect from 1st July 2017. It is one of the biggest reforms in the field of indirect taxes in India since independence. GST has replaced many indirect taxes previously existed in India into a single tax. Present paper explores need and advantages of GST and the impacts of GST on various sectors in Indian economy, like agriculture, manufacturing, real estate, financial sector and revenue of the government.

Keywords: Goods and Service Tax, GST, Need, Advantages, Impact

Introduction :

With the 101st Constitutional Amendment Act come into force on 8th September, 2016 and notification of GST Council on 15th September 2016 then India has introduced GST with effect from 1st July 2017. GST is an indirect tax levied on the supply of goods and services. The previous indirect tax structure is complex. In a pre-GST regime there were many taxes imposed by the central and state governments on goods and services. GST unified one national market across the country. GST has impact on about all sectors in Indian economy.

Objectives of the study :

Present paper is an attempt to explore the needs of GST and also the benefit of GST. It is trying to measure the impact of GST on Agriculture sector, Industrial sector and Real estate sector. It is also gives the general information about the GST.

Research Methodology :

This paper is descriptive in nature. It is based on secondary data. Data has been collected through various books, journals, news papers and websites.

What is GST?

Goods and Service Tax is basically a tax policy that brought uniform market all around the country. GST reduced the complicated structure of taxation as it creates a single tax. This was also reducing the burden of tax on businesses and consumers.



डॉ. बाबासाहेब आंबेडकरांचे सर्वसमावेशक वृद्धीबाबतचे योगदान

डॉ. नारायण नामदेव गाढे

सहयोगी प्राध्यापक (अर्थशास्त्र)

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प्रास्ताविक

भारतातील अलिकडच्या काळातील शासनाची धोरणे अभ्यासली तर त्यामध्ये प्रामुख्याने दलित, आदिवासी, दारिद्र्यात जीवन जगणाऱ्या व्यक्ती व महिला यांच्या सबलीकरणासाठी व त्यांना देशाच्या विकासाच्या मुख्य प्रवाहात आणण्याच्या दृष्टीने उचलेले पाऊल आहे. २० व्या शतकाच्या शेवटी संपूर्ण जगात सर्वसमावेशक आर्थिक वृद्धीबद्दल बोलले जात आहे. समाजातील मागासलेल्या जाती जमातींचा आर्थिक विकास घडवून आणण्यासाठी शासनाने अनेक कार्यक्रम हाती घेतले आहेत. जसे जनधन बँक खाते, उजाला योजना, गरिबांना मोफत वीज कनेक्शन, मजूर व कामगारांचा विमा, मोफत व सक्तीचे प्राथमिक शिक्षण, आरोग्यविषयक सुविधा, रोजगार हमी योजना आणि अन्य योजना सर्वसमावेशक आर्थिक विकासासाठी राबविल्या जात आहेत. जगभरातील अर्थशास्त्रज्ञ आणि आर्थिक विचारवंत आज ज्या पद्धतीने सर्वसमावेशक आर्थिक विकासाबाबत चर्चा करीत आहेत त्याची चर्चा आणि कृती डॉ. बाबासाहेब आंबेडकर यांनी २० व्या शतकातच केलेली दिसून येते. डॉ. आंबेडकर याबाबतीत शंभर वर्षे पुढे होते असेच म्हणावे लागेल. डॉ. आंबेडकरांनी संविधानाच्या माध्यमातून, वेळोवेळी मांडलेल्या विचारातून व केलेल्या कार्यातून तसेच त्यांच्या स्वतंत्र मजूर पक्षाच्या जाहिरनाम्यातून सर्वसमावेशक आर्थिक विकासाविषयी महत्त्वाचे योगदान दिले आहे.

डॉ. आंबेडकर यांच्या विचारांचा आढावा घेतल्यास एकविसाव्या शतकातही त्यांच्या विचारांची उपयुक्तता विशेषत्वाने जाणवते. प्रस्तुत शोध निबंधात डॉ. आंबेडकर यांच्या सर्वसमावेशक आर्थिक वृद्धीच्या दृष्टीने दिलेल्या योगदानाचे विवेचन केलेले आहे.

शोधनिबंधाची उद्दिष्टे

प्रस्तुत शोधनिबंधाची उद्दिष्टे पुढीलप्रमाणे निश्चित करण्यात आलेली आहेत.

१. सर्वसमावेशक आर्थिक वृद्धीची संकल्पना अभ्यासणे.

२. सर्वसमावेशक आर्थिक वृद्धीबाबत डॉ. आंबेडकर यांनी दिलेल्या योगदानाचा चिकित्सक अभ्यास करणे.

संशोधन पद्धती

प्रस्तुत शोधनिबंधाच्या पूर्णत्वासाठी विश्लेषणात्मक संशोधन पद्धतीचा अवलंब केलेला असून तथ्यांचे संकलन करण्यासाठी दुय्यम तथ्यांचा आधार घेण्यात आलेला आहे. दुय्यम माहितीचे संकलन विविध ग्रंथ, मासिके, साप्ताहिके व इंटरनेट इत्यादी द्वारे करण्यात आलेले आहे.

सर्वसमावेशक वृद्धीची संकल्पना (Concept of Inclusive Growth)

देशाच्या आर्थिक वृद्धी प्रक्रियेत सर्वांना सामावून घेणाऱ्या वृद्धीला सर्वसमावेशक वृद्धी असे म्हटले जाते. यालाच समोवशी वृद्धी असे देखील म्हटले जाते. ही संकल्पना विकासाचा डावपेच म्हणून सर्वप्रथम ११ व्या पंचवार्षिक योजनेच्या 'दृष्टीकोन पत्रात' मांडण्यात आली.

THE NEED OF ICT TO ENHANCE THE COMMUNICATIVE COMPETENCE IN ENGLISH

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Abstract: *Presently, human beings are living in a technological society where literacy in Information and Communication Technology (ICT) is one of the fundamental things required to lead life successfully. ICT is a valuable tool to enhance the quality of teaching learning. So there is the need to integrate it in the English curriculum as well as in the English pedagogical practices. It will enhance the abilities of the students by making them literate lifelong learners and the competent global citizens. In the present research paper, the researcher has tried to reiterate the importance of the use of the above technological tool to develop the students' oral communicative skills in English. It is done by referring to the information collected for the research project.*

Key words: technological society, Information and Communication Technology, English curriculum, English pedagogical practices, oral communicative skills in English.

Introduction:

The use of ICT in the English classroom not only makes students smart students in the academic stream but also allows them to become competent users as well as consumers in English to face the challenges successfully while living out the global life. It is important not only to gain the key outputs of the curriculum and syllabi but also for the all round development of the students. Research suggests that incorporating ICT into the English curriculum can improve writing and reading skills, develop speaking and listening skills as well as support collaboration, creativity, independent learning and reflection. ICT is an interactive and collaborative medium which allows responding, composing, and publication to be easily shared among peers. It gives students the opportunity to explore the language of texts more creatively. It helps them to develop as speakers, writers and readers. ICT helps students to access information and respond to the e-texts, to organize and present information in a variety of forms and to develop understanding of language and critical literacy. If used properly, these advantages of ICT ultimately will help to enrich their English communicative competence.

In the present research paper, to reiterate the use of ICT in English teaching- learning as a tool to enhance the communicative competence of students the researcher has referred to the responses of students to a few questions that are the part of the questionnaire for the Minor Research Project carried out by him and submitted to University Grants Commission, New Delhi in 2014. The following factors are taken into consideration while writing out this research paper.

1. Level of satisfaction with present communicative competence in English

The students' responses to this aspect prove that whether the students under study have adequate communicative competence in English language or not. It indirectly asserts the need for the present type of research. The question asked to test the above aspect and the responses received are as under:



Use of Computer in Teaching English Literature

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Abstract:

The use of Information and Communication Technology (ICT) has become an important issue in an age of science and technology of the present day. Teachers using powerpoint presentation can get better learning outputs than those who use traditional teaching methods. In fact, ICT may be used very much creatively in order to enhance the quality of teaching English language and literature. Computer is an important educating tool in this context. Computer proves to be a creative tool to teach the literary genres. Development of Computer Assisted Language Learning (CALL) may be supposed to be an embodiment of the same. It seems that, hereafter, the study of ELLT will remain incomplete without considering the use of ICT.

Key words:

Information and Communication Technology (ICT), science and technology, powerpoint presentation, traditional teaching methods, computer, Computer Assisted Language Learning (CALL), ELLT.

Introduction:

The use of ICT in teaching learning includes basically the use of electronic teaching tools like a computer. "Computer can be utilized with other multimedia learning devices or it can stand alone (a standard PC) and still serves its basic purpose as an electronic medium of language learning" (Hartoyo, 2012:29) (qtd.) states the importance of computer as a tool of language learning. The use of computer as a means of instruction is useful for both teacher and students. It helps the teacher to make his teaching more precise, informative, interesting and result oriented. The students can understand the topic well when computer is being used as a teaching tool. The reason is the natural attraction of this multimedia device in them for the wonders it can bring forth through its technology.

Computer as a Teaching Tool in Teaching English Literature:

In the context of teaching English literature, as a teaching tool, computer may be used as complimentary to teach the literary text. The text may be shown as being acted upon on the computer screen. It will give a live alternative experience to the learners which will somewhat comply, though in a transformed manner, with that of the original experience of the creative writer before putting it into words. For example, a beautiful poem *Daffodils* may be visualized on the computer screen by recording an artificially created scene which will be similar to that of the description by William Wordsworth or any other natural scene in the realm of nature similar to the description of daffodils in the poem. After learning *Daffodils* through this method, students perhaps will not forget the poem because the visuals are having greater impact upon human mind (most of the bollywood movies or TV serials are remembered for years because of their audio-visual form).

8.

A Study of the Nature of Teaching Methodology in the Context of Developing English Oral Communicative Skills

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Abstract:

Though English is taught as a second language (L2) in India, it has yet remained just like a foreign language to most of the people in the country. For oral communication, it is not used at all in the rural society and to a very little extent in the urban society. That is why teaching of English in Indian classroom bears a different context. The students need to get the practice of these skills in the college campus itself as there is either no one or a very few of them to communicate with in English outside of the college campus. From this perspective, the researcher has tried to shed light on the nature of presently used teaching methods at the college level.

Key words: second language (L2), oral communication, teaching methods

The nature of teaching methodology is important from the point of view of the due development of English oral communicative skills in students. According to K.L. Sharma, "...nowadays, the only true form of a language is its spoken form, of which a written language is a reflection; that is why, the teaching methods should be arranged in such a way that the oral communicative skills get an ample focus. It is very often noticed that due to the use of unsuitable teaching methods, the students always remain the passive learners. Unfortunately, it is always observed that the students do not give their personal opinions or reactions in the classroom because "Perhaps their traditional mode of education has stressed rote learning and a rather authoritarian role for the teacher" (Gillian Lazar). So the teaching methods need to be arranged and used in such way that will enable to give ample practice of the oral communicative skills to students in the classroom itself and, thus, it will create opportunities to turn out them into active learners. The following is the picture regarding the use of the teaching methods to teach English at the college level:

1.1 Widely Used Teaching Method

In the college classrooms, the lecture method, whereby the teacher disseminates information through a talk on the chosen topic and the students usually are silent listeners, still remains a widely used teaching method for teaching English language. This method is based on the transmissional perspective of communication. The picture is almost the same in most of the institutions of higher learning. The proper combination of various teaching methods needs to be adopted for the development of oral communicative skills in students. The practice of the oral communicative skills should be given due importance and time to get fruitful results.

It is also observed that the teachers are not able to focus well on the teaching-learning activity due to the increasing number of co-curricular and extra-curricular activities in the colleges. It too directly or indirectly affects all types of learning. Another limitation seen in Indian teachers is that some of the English teachers are not familiar with the latest developments in ELT pedagogy. Most of the times, they themselves are not well equipped to teach English to students. The most serious problem in the teaching of English in India is the

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THE NATURE OF EVALUATION AS A BARRIER TO IMPROVE ENGLISH ORAL COMMUNICATION OF STUDENTS

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Abstract:

In the present research paper, as a part of the study of current status of teaching-learning practices in English classrooms at the post graduate level, the nature of evaluation of different universities across India is studied. It is tried to know how much of it is responsible for an inadequate and uneven development of English oral communicative skills of students. The data for the study is acquired through the web source and the analysis is only indicative and does not give an ultimate impression about any of the universities studied.

Key words: Teaching-learning practices, evaluation, English oral communicative skills

It is often noticed that even after completing the college education, many of the post graduate students of English are not able to orally communicate well in English. The roots of this problem may be searched in the nature of evaluation that is being practiced mostly. In fact, evaluation plays an important role for motivating students for learning at least in the context where mostly the teaching learning is examination oriented. Until the same picture does change, there is a need to find out a way to cope up better with the prevailing practices which ultimately will be successful in achieving at least a handful of genuine learning outcomes. From this perspective, the present study is undertaken. Through the study, it has been tried to associate the prevailing nature of evaluation with the undue and uneven development of the English oral communicative skills among students.

The following table represents some of the data acquired for the study.

Sr. No.	University	Evaluation	
		Internal Evaluation (Marks)	University Exam (Marks)
1	University of Kerala, Thiruvananthapuram	25	75
2	Thiruvalluvar University, Vellore	25	75
3	University of Calcutta, Kolkata	20	80

RECENT TRENDS IN ENGLISH LITERATURE

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Abstract

'Literature as a mirror of society' is the most popular and well accepted definition of the literature. It reflects human society in the most authentic manner. Since a society is made up of human beings, literature also reflects the life of human beings living in that society. The relationship between literature and society is reciprocal. The different factors of the society like culture, religion, political and economical norms, etc produce the literature of that society. At the same time literature also affects these factors of the society. Thus both grow and develop hand in hand. Therefore, we come across different trends of literature through different centuries. This is also one of the reasons why we find new trends continuously emerging in literature. A study of these different trends not only unfolds the literature of that period but also throws substantial light on the history of the society. Change is an inevitable fact of human life as well as human society. Literature is not an exception to it as it reflects both human life and society. A study of the new trends in literature reveals how the literature has undergone a change through the centuries.

Keywords: English Drama, English Poetry, Literary Criticism

English Literature: A Global View

Since English language has the status of the international language, the scope of the English literature has become very wide. Now English literature is produced by many nations other than England. This has obviously given rise to different trends in English literature with different characteristic features. Earlier there were two major categories or traditions of English literature known as the British literature and the American literature. Though both are the literatures in English still both have distinct features that retained their separate identities and uniqueness. Soon there emerged Indian writing in English, African literature in English, Canadian and Australian literature.

In the beginning of the 20th century there emerged the third variety of English literature. It is known as the Commonwealth literature. It is the literature produced in the countries other than England and America. The literature produced in African and Asian countries comes under the category of the Commonwealth literature. The Commonwealth literature is also known as the Postcolonial literature. This literature becomes distinct due to its special thematic concerns. The Postcolonial literature is also known as the Third World literature.

Later on we get Post-colonial literature. The hyphenated term really makes the difference and this literature is all together different than the Postcolonial literature. If we read this literature we can feel the refined sensibilities and a broad outlook of the writers.

Recently there has occurred fourth category of English literature which is known as the Fourth World Literature. The Fourth world refers to the most underdeveloped regions of the world. They are most poverty stricken and economically troubled part of the countries in the third world. The term fourth world is also synonymous with the stateless, poor, marginal nations. Unlike first, second or third world they are far away from the mainstream. They are often seen living hunter gatherer lifestyles. And mostly the people belonging to the tribal and nomadic communities are included in it. As they are totally separated from the main community they don't have political ties or identity as such. They may be fully self supporting units. But on the basis of their economic conditions they are placed under the Fourth world status. In this way the ethnic minorities, linguistic minorities as well as the cultural and religious minorities also come under the canvass of the Fourth world literature.

The Fourth world also encompasses those working in the field of peace action, ecology, economics, energy resources, women's liberation and the whole spectrum of alternative movements who are struggling against the gigantism of the institutions of mass societies. All minority literature comes under the Fourth world as it is a voice of the oppressed and underprivileged class of the world. As it is the literature for the voiceless of the third world it goes on widening its scope to encompass even refugee, immigrants or transgender people under the Fourth world besides the natives and aboriginals. Thus the Fourth world literature becomes like a microscope that tries to see the intensity of the problems faced by the natives of the lands who are the real owners of the land but now are separated from the mainstreams. It is an attempt to look into the issues minutely by unfolding it at the deeper levels.

New Trends in English Fiction

Since the 20th century novelists have laid greater stress on the art form of the novel we come across many trends in the fiction. They have rejected the irrelevancies and moralizing of the Victorians. Modern novels are not loose and rambling like the earlier novels but are very compact. With all its merits and technical

निर्यातीसाठी उत्पादनवरील कराने अधिक परिणामकारक प्रभावलोपन होणार असल्याने उत्पादने आंतरराष्ट्रीय बाजार पेटेत अधिक स्पर्धात्मक होतील आणि भारतातील निर्यातीला चालना मिळेल. त्याचप्रमाणे मेझमाठी निर्यात आणि पुरवठा शुन्य दगने होईल.

६) ग्राहकांना फायदा —

अ) उत्पादक, दुकानदार आणि सेवा पुरवठादारांना मातल्याने इनपट टॅक्स क्रेडिटचा अखंड लाभ होणार असल्याने वस्तूची अंतिम किंमत कमी राहण्याची अपेक्षा आहे.

ब) प्रक्रिया उद्योग व कंपन्यांवरील करचा मगमग योजा कमी होण्याची शक्यता असल्याने त्यातून किंमती कमी होण्याची अपेक्षा आहे. कमी किंमती म्हणजेच उपभोग आधिक्य होय.

१०) नोंदणीकृत व्यक्तींनी भरलेल्या कराबाबत स्वमुल्यांकनाची त्रुटि करण्यात आली आहे.

सारांश —

वरतूव सेवा कर प्रणालीमुळे अर्थव्यवस्था गतिमान होऊन प्रक्रिया उद्योगात वृद्धी होणार आहे. हा बदल काही काळासाठी त्रामदायक ठरेल. परंतु केंद्र व राज्यसंस्कारमधील कर अधिकारी यांचा यशस्वी अमलबजावणीसाठी कार्यरत आहेत. कमी काळा वधीसाठी घेतलेले वेदनेचे औपक्ष भारतीय अर्थव्यवस्थेच्या आगण्यासाठी लाभदायक ठरणार आहे.

संदर्भ —

- १) भारतीय अर्थव्यवस्था — भागीरथ प्रकाशन
- २) भारतीय अर्थव्यवस्था — दीपस्तंभ
- ३) योजना मासिक — ऑगस्ट २०१९
- ४) भारतीय अर्थव्यवस्था व्हेमामिक — रत्नाई

प्रकाशन

- १) कृषि प्रक्रिया उद्योग — गोदावरी प्रकाशन



भारतातील माहिती केंद्र आणि ग्रंथालयाच्या वाचकांना ऑनलाईन माहिती सेवा देणारे नेटवर्क

प्रा. संभाजी पी. व्याळीज

ग्रंथपाल,

लोकनेते व्यंकटगव हिरे महाविद्यालय पंचवटी,
नाशिक

सारांश :

माहितीचा (Information) प्रवाह किंवा माहितीची देवाण — घेवाण इलेक्ट्रॉनिक माध्यमाद्वारे कशी होते. नेटवर्कमधील स्थाने (Points) एकमेकांशी कसे जोडले जातात व त्यामध्ये माहिती कशी प्रवाहित होते हे जाणून घेणे हा एक उत्सुकतेचा विषय आहे. आपले दैनंदिन जीवनच नेटवर्क या विषयाशी निगडित झाले आहे. दृश्वनी नेटवर्क, वॉकांचे नेटवर्क, रेल्वेचे नेटवर्क, इत्यादी जाळ्यांचा आपल्याला जवळून परिचय आहे. या लेखात आपल्याला यांपैकी फक्त माहिती संबंधी इलेक्ट्रॉनिक माध्यमाशी निगडित इनफ्लिबनेट केंद्राच्या माध्यमातून एन. लिस्ट आणि राष्ट्रीय सूचना विज्ञान केंद्र, माहिती तंत्रज्ञान मंत्रालय, भारत सरकार आणि भारत सरकारच्या संस्कृती मंत्रालयाने मान्यता दिलेल्या DELNET डेव्हलपिंग लायब्ररी नेटवर्कचा अभ्यास करणे.

इनफ्लिबनेट केंद्राच्या माध्यमातून एन. लिस्ट हा प्रकल्प भारतातील महाविद्यालयीन स्तरातील ग्रंथालयांसाठी उपलब्ध करण्यात आलेला आहे. तसेच राष्ट्रीय सूचना विज्ञान केंद्र आणि भारत सरकारच्या संस्कृती मंत्रालयाने डेलनेट या माहितीच्या नेटवर्कला समर्थन दिले आहे. ग्रंथालयांच्या नेटवर्कच्या माध्यमातून ग्रंथालयांमध्ये माहिती प्रसारण करण्याच्या मुख्य उद्देशाने