

Rayat Shikshan Sanstha's
Dr. Patangrao Kadam Mahavidyalaya, Ramanandnagar (Burli)

RESEARCH PROMOTION COMMITTEE

Research Publications

Academic Year 2020-2021

Sr. No	Title of the paper	Name of the Author	Title of the journal	ISSN/ ISBN
1	Synthesis and characterization of hydrothermally prepared molybdenum disulfide for super capacitor application	Dr. L. D. Kadam (Principal)	Materials Today: Proceeding	00002014
2	Facile hydrothermal synthesis of Cu ₂ SnS ₃ nano particles for photo catalytic dye degradation of mythelene blue	Dr. L. D. Kadam (Principal)	Materials Today: Proceeding	00002014
3	Sol-gel prepared vanadium oxide for photo catalytic degradation of Methylene Blue dye	Dr. L. D. Kadam (Principal)	ELSEVIER	2214-7853
4	Thin Zn _{1-x} Mn _x O films (x=1-4at%) by chemical Bath deposition: Influence of DuPont concentration	Dr. L. D. Kadam (Principal)	IJSPHTS	1061-3862
5	Effect of zinc substitution on magnesium ferrite nanoparticles: Structural, electrical, magnetic, and gas-sensing properties	Prof. P. B. Piste	Materials Science & Engineering B	0921-5107
6	Ultrasound-assisted, green and efficient synthesis of ferrocene appended azo-phenothiazines	Prof. P. B. Piste	ELSEVIER	2666-0865
7	Sant Tukaramche kutkavya v tyacha chikisak abhayas	Mr. Kone D.M.	Power of Knowledge	2320-4494
8	Dr. Babasaheb Ambedkaranache Striya babatche Kary	Mr. Kone D.M.	Ajanta	2277-5730
9	Kay Dengour vara sutalay ya Natakache Parikshan	Mr. Kone D.M.	Power of Knowledge	2320-4494

10	Prakashvata" ya aatmacharitracha ghetlele Shodh	Mr. Kone D.M.	Ajanta	2278-9308
11	Thin $zn_{1-x}Mnx_o$ films($x=1-4at\%$)by chemical Bath deposition: Influence of Dopant concentration	Dr. G.R. Patil	IJSPHTS	1061-3862
12	Magnetically Recoverable $BiVO_4/NiFe_{204}$ Nanocomposite Photocatalyst for efficient Detoxification of Polluted Water Under Collected Sunlight	Dr. G.R. Patil	Materials Research Bulletin	110908
13	Thin $zn_{1-x}Mnx_o$ films($x=1-4at\%$)by chemical Bath deposition: Influence of Dopant concentration	Dr. Rout V.S.	IJSPHTS	1061-3862
14	Thin $zn_{1-x}Mnx_o$ films($x=1-4at\%$)by chemical Bath deposition: Influence of Dopant concentration	Ms. Kamable N.J.	IJSPHTS	1061-3862
15	Synthesis of N-Mannich bases from 3,4-dihydropyrimidin-2(1H)-ones by using nanostructured Cobalt Chloride Doped Polyaniline Composite as Catalyst (PANI-Co)	Mr. Umesh S. Shelke	Journal of Physics: Conference Series	012018(1-8)
16	Pradeshik Asamtol : Sankalpanatmak Adhyayan	Dr. V. D. Patil	Ajanta	2277-5730
17	21vi sadi ke hindi kahani sahitya me mulyaparivartan	Mr. N.H. Khumbhar	International Journal or Social Science & Management Studies	2454-4655
18	Unravelling the regulatory role of miRNAs in secondary metabolite production in medicinal crops.	Mr. Abhijit Bhagwan Mane	ELSEVIER	100303


Chairperson


Principal,
Dr. Patangrao Kadam Mahavidyalaya,
Ramanandnagar (Burla)
Tal. Palus, Dist. Sangli.



Synthesis and characterization of hydrothermally prepared molybdenum disulfide for supercapacitor application

K.B. Pisal^a, A.S. Thorat^a, S.S. Jagtap^a, A.K. Gadekar^a, P.K. Pagare^a, S.H. Mujawar^a, L.D. Kadam^{b,*}

^a Department of Physics, Yashwantrao Chavan Institute of Science, Satara, India

^b Department of Physics, Arts, Science and Commerce College, Ramnandnagar, Sangli, India

ARTICLE INFO

Article history:

Received 23 April 2020

Received in revised form 31 May 2020

Accepted 6 June 2020

Available online xxxxx

Keywords:

Molybdenum disulfide

Hydrothermal method

Supercapacitor

Cyclic voltammetry

XRD

ABSTRACT

A simple and facile hydrothermal method has been used for synthesis of molybdenum disulfide (MoS_2). The structural and morphological properties of as-prepared MoS_2 were characterized by X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), Raman spectroscopy and scanning electron microscopy (SEM) techniques respectively. The XRD results indicate that the as-prepared MoS_2 material shows polycrystalline nature. The optical properties of MoS_2 were investigated by UV-Vis absorption spectroscopic technique. The UV-Vis absorption spectra show absorption of light in visible region. The supercapacitor behavior of MoS_2 was studied by cyclic voltammetry (CV). These results indicate that MoS_2 is promising material for supercapacitor application.

© 2020 Elsevier Ltd. All rights reserved.

Selection and Peer-review under responsibility of the scientific committee of the International Conference on Multifunctional and Hybrid Materials for Energy and Environment (MHME-2020).

1. Introduction

The globalization and digitalization of the human race has paved a way for power hungry world. With the depleting non-renewable resources, global community is already looking for a high energy density centric and fast charging power device [1]. Supercapacitors are the heart of this research field. Size, energy density, morphology and porosity are the building blocks of research in this field [2]. Basically, there are two types of capacitors based on their charge storage mechanisms (i) Electrical double layer capacitors, commonly known as EDLCs and (ii) Pseudocapacitors. EDLCs use carbon as an active material and is preferred for consumer electronic items, military equipments that require robust mechanism as well as electrical vehicles [3]. Pseudocapacitors are advanced as compared to EDLC and use polymers and metal oxides and have higher capacitance than EDLCs. High theoretical specific capacitance and low cost are the strong headpoints for the transition metal sulfide based supercapacitors [4].

Molybdenum disulfide has attracted worldwide attention in various applications such as Li-ion batteries [5], hydrogen evolution [6], counter electrode for dye sensitized solar cells (DSSCs)

[7], sensors [8], supercapacitors [9,10] etc. due to its unique sheet like structure and higher conductivity. Due to layered structure MoS_2 can provide large surface area which enhances the capacitance of supercapacitor [11].

Numerous methods have been reported for the synthesis of MoS_2 such as chemical vapor deposition (CVD) [12], DC sputtering [13], electrodeposition [14], SILAR [15], chemical bath deposition (CBD) [16] etc.

The present research work is focuses on preparation of MoS_2 material via simple and cost effective hydrothermal method for supercapacitance application. For MoS_2 material synthesis, there were no major limitations as compared with other materials. As-synthesized MoS_2 material was characterized via various characterization techniques. The electrochemical performance of MoS_2 were examined through cyclic voltammetry and electrochemical impedance measurements. This work shows the role of scan rate on specific capacitance of MoS_2 material.

2. Experimental

2.1. Preparation of MoS_2 material

All chemicals used for MoS_2 preparation were analytical reagent (A. R.) grade. 0.01 M sodium molybdate and 0.2 M thiourea were dissolved in 100 ml of double distilled water (DDW). The pH value

* Corresponding author.

E-mail addresses: komalbpisal@gmail.com (K.B. Pisal), kdaxman_222@yahoo.co.in (L.D. Kadam).

<https://doi.org/10.1016/j.matpr.2020.06.156>

2214-7853/© 2020 Elsevier Ltd. All rights reserved.

Selection and Peer-review under responsibility of the scientific committee of the International Conference on Multifunctional and Hybrid Materials for Energy and Environment (MHME-2020).

Materials Today: Proceedings xxx (xxxx) xxx. <https://doi.org/10.1016/j.matpr.2020.06.156>



Contents lists available at ScienceDirect

Materials Today: Proceedings

journal homepage: www.elsevier.com/locate/matpr

Facile hydrothermal synthesis of Cu_2SnS_3 nanoparticles for photocatalytic dye degradation of methylene blue

Archana R. Machale^a, Shilpa A. Phaltane^a, Harshad D. Shelke^b, Laxman D. Kadam^{c,*}

^a Solid State Physics Laboratory, Department of Physics, Yashwantrao Chavan Institute of Science Satara, Maharashtra 415001, India

^b Thin Film Physics Laboratory, Department of Physics, Shivaji University, Kolhapur, Maharashtra 416004, India

^c Arts, Science and Commerce College of Ramanand Nagar, Sangli, Maharashtra 416310, India

ARTICLE INFO

Article history:

Received 17 March 2020

Received in revised form 30 June 2020

Accepted 8 July 2020

Available online xxx

Keywords:

Cu_2SnS_3
Dye degradation
Hydrothermal
Nanoparticles
Photocatalyst

ABSTRACT

Ternary copper tin sulfide Cu_2SnS_3 (CTS) has been effectively amalgamated by hydrothermal method. The crystal structure, surface morphology and optical properties of the primed sample have been studied. XRD pattern of synthesized CTS shows the triclinic crystal structure. The SEM images confirm the uniform spherical grain like structure. The photocatalytic activity of the as synthesized CTS was tested under visible light irradiation by measuring the degradation of methylene blue (MB). CTS show a broad absorption in the visible and the IR region. The optical bandgap of CTS nanoparticles (2.2 eV) has been determined. A more realistic mechanism for the photocatalytic activity of CTS is proposed.

© 2020 Elsevier Ltd. All rights reserved.

Selection and Peer-review under responsibility of the scientific committee of the International Conference on Multifunctional and Hybrid Materials for Energy and Environment (MHME-2020).

1. Introduction

Now a days water pollution became a foremost universal issue. Diverse sources of water pollution are mostly industrial sources such as textile, leather, pharmaceutical, plastics and paper, food and dye industries. The wastewater released from these industries involves an unusual organic dyes which are toxic and hurtful to human being and the environment as well. So the removal of these dyes from the polluted water became a challenge. Photocatalysis is the most hopeful technique to resolve such problem. A semiconductor photocatalysts getting a lots of attention owing to its outstanding performance as semiconductor catalysts. It degrade a wide range of toxic compounds under the solar irradiation [1]. Along with the semiconductor catalysts, titanium dioxide (TiO_2) and zinc oxide (ZnO) have been acknowledged the most awareness in research and development of photocatalysis technology caused by their electronic, chemical and thermal properties [2,3]. However TiO_2 has the band gap of 3.2 eV and ZnO has 3.37 eV, hence are active in only ultra-violet region of light, which is only of 4–5% of the total solar energy spectrum. It is not responsive to visible light ($\lambda > 400 \text{ nm}$) [3]. Hence the semiconductors like cadmium

sulfide (CdS) and Indium sulfide (In_2S_3) with the narrow bandgap has been getting used [4,5]. Unfortunately, they suffer from the downsides like, the production and use of Cd and In, in relevant compounds are dangerous to human health, include toxic elements, high cost because of Cd and In are the rare earth elements. So it is pleasing to have photocatalysts amid earth abundant elements, economical, non-toxicity, high constancy and also susceptible to visible light region. These necessities turned the researchers towards the commercial, earth abundant, non-hazardous ternary group semiconductor with small or mid band gap. In the ternary Cu-Sn-S system, Cu_2SnS_3 (CTS) semiconductor of I-IV-VI group, for the reason that of their attractive, outstanding optical-thermal-mechanical properties attracted a great deal of attention. CTS is a ternary compound ideal as an admirable absorbing material for photovoltaic applications because of its high absorption coefficient ($>10^4 \text{ cm}^{-1}$) and tunable bandgap (1.2 to 1.4 eV) [6]. However, CTS is the most hopeful compound in the Cu-Sn-S system because of its wide stability range and lack of Fermi level pinning [7].

Moderately a plenty of synthesis approaches have been incorri- to be appropriate for fabricating CTS nanoparticles. Physical methods contain vacuum evaporation [8], solid state reaction [9], co-evaporation [10,11], pulsed laser deposition (PLD) [12,13], electron beam evaporation [14,15] and sputtering [16]. Similarly, some chemical methods such as chemical bath deposition (CBD) [17],

* Corresponding author.

E-mail address: kdilaxman_222@yahoo.co.in (L. D. Kadam).

<https://doi.org/10.1016/j.matpr.2020.07.481>

2214-7853/© 2020 Elsevier Ltd. All rights reserved.

Selection and Peer-review under responsibility of the scientific committee of the International Conference on Multifunctional and Hybrid Materials for Energy and Environment (MHME-2020).



View PDF

Access through your institution

Purchase PDF

Materials Today: Proceedings

Volume 43, Part 4, 2021, Pages 2673-2677

Sol-gel prepared vanadium oxide for photocatalytic degradation of Methylene Blue dye

Bapuso M. Babar ^a, Aniruddh A. Mohite ^a, Vithoba L. Patil ^b, Udayraj T. Pawar ^d, Laxman D. Kadam ^c, Prakash M. Kadam ^d, Pramod S. Patil ^b 

Show more  Outline |  Share  Cite<https://doi.org/10.1016/j.matpr.2020.04.205>

Get rights and content

Abstract

In the present work vanadium oxide (V_2O_5) was prepared by simple and direct sol-gel method by using ammonium metavanadate as precursor in the presence of ammonia as complexing agent. For structural and morphological analysis of V_2O_5 different characterization techniques were used. X-Ray Diffraction and Fourier Transform Spectroscopy were used for structural identification and functional group detection. The morphology of prepared material was studied by Scanning Electron microscopy technique. For band gap measurement (optical study) of V_2O_5 , the UV-Visible Spectrophotometer techniques were used. Finally the Photocatalytic activity of the calcinated product for Methylene Blue (MB) dye was studied. The percentage of degradation and rate constant also calculated. The present work shows the good photocatalytic activity of V_2O_5 for hazardous MB dye and degradation take place in this case is about 75%. Thus V_2O_5 is promising material for photocatalytic activity.



Previous

Next FEEDBACK 

Thin $\text{Zn}_{1-x}\text{Mn}_x\text{O}$ Films ($x = 1\text{--}4$ at %) by Chemical Bath Deposition: Influence of Dopant Concentration

G. R. Patil^a, M. B. Shelar^{b,*}, N. J. Kambale^a, L. D. Kadam^a, V. S. Raut^a, and B. N. Pawar^c

^a Department of Physics, Dr. Patangrao Kadam Mahavidyalaya, Ramanandnagar, Sangli (affiliated to Shivaji University), Maharashtra, India

^b Thin Film Materials Laboratory, Department of Physics, D.Y. Patil College of Engineering and Technology, Kolhapur (affiliated to Shivaji University), Maharashtra, India

^c Department of Physics, Bharati Vidyapeeth Deemed University, Yashwantrao Mohite College, Pune, Maharashtra, India

*e-mail: maheshshelar29@gmail.com

Received January 10, 2021; revised February 27, 2021; accepted March 3, 2021

Abstract—Thin films of $\text{Zn}_{1-x}\text{Mn}_x\text{O}$ ($x = 1\text{--}4$ at %) were applied onto a glass substrate by low-cost chemical bath deposition (CBD). The films were characterized by XRD, UV–VIS absorption spectra, SEM, and vibrating sample magnetometry—with special emphasis on the influence of dopant concentration x . Structural and optical properties of deposited films imply that the Mn^{2+} ions substituted Zn^{2+} ions without changing the wurtzite structure of ZnO. No impurity phases were detected in XRD patterns. The band gap in ZnO was found to increase with increasing x . Magnetic measurements showed that Mn-doped ZnO samples exhibited ferromagnetic behavior at room temperature, which tentatively was associated with the replacement of Zn^{2+} ions by Mn^{2+} ions in the ZnO lattice.

Keywords: thin Mn-doped ZnO films, chemical bath deposition (CBD), optical properties, ferromagnetism

DOI: 10.3103/S1061386221020096

1. INTRODUCTION

Over the past two decades, diluted magnetic semiconductor materials have attracted much attention as an excellent media in which both the charge (electron and holes) and spin related phenomena take place in a one and the same substance, which is an important property for spintronic devices [1]. Due to a large exciton binding energy of ZnO, some zinc ions can be replaced by magnetic ions capable of ferromagnetic coupling [2]. Among other transition metals, ZnO doping with Mn seems most encouraging because Mn has a highest possible magnetic moment [3], and the first half of the d -band is fully occupied, thus promoting the formation of a stable fully polarized state. In addition, Mn is isomorphic to Zn and exhibits variable oxidation state and acceptor properties in a ZnO matrix since the ionic radius of Zn^{2+} (0.74 Å) is smaller than that of Mn^{2+} (0.80 Å) and larger than that of Mn^{3+} (0.66 Å).

There are continuing efforts to elucidate the origin of the observed ferromagnetism in Mn-doped ZnO [4] and the Mn^{2+} -induced room-temperature ferromagnetism and spin-glass behavior in hydrothermally grown Mn-doped ZnO nanorods [5] where the ferromagnetic ordering got stabilized upon an increase in hole concentration. Wojnarowicz et al. [6] studied the

structural and magnetic properties of Co–Mn co-doped ZnO nanoparticles obtained by microwave solvothermal synthesis. Yan et al. [7] described Mn-doped ZnO nanorod arrays prepared by CVD method with ferromagnetic ordering above room temperature. Droubay et al. [8] synthesized Mn-doped ZnO epitaxial thin films at different temperatures and achieved room temperature ferromagnetism in the samples synthesized at 950°C. Sample preparation and annealing effects on the ferromagnetism in Mn-doped ZnO can be found in [9].

To date, bulk samples and thin films of Mn-doped ZnO have been prepared by different methods such as sol–gel [10], radiofrequency magnetron sputtering [11], pulsed laser deposition [12], and spray pyrolysis [13]. Ferromagnetism in different $(\text{ZnO})_{1-x}(\text{MnO}_2)_x$ systems still remains controversial and the magnetic properties of oxide films were found highly sensitive to preparation method [14, 15].

In this communication, we report on the preparation of thin $\text{Zn}_{1-x}\text{Mn}_x\text{O}$ films ($x = 1\text{--}4$ at %) by low-cost chemical bath deposition (CDD) method and their characterization, with special emphasis on the influence of dopant concentration x .



Effect of zinc substitution on magnesium ferrite nanoparticles: Structural, electrical, magnetic, and gas-sensing properties

Rohit R. Powar^{a,f}, Varsha D. Phadtare^b, Vinayak G. Parale^b, Sachin Pathak^c, Kallapa R. Sanadi^d, Hyung-Ho Park^{b,*}, Devidas R. Patil^c, Pravina B. Piste^f, Dnyandevo N. Zambare^{a,e}

^a Department of Chemistry, Kisan Veer Mahavidyalaya, Wai 412803, Maharashtra, India

^b Department of Materials Science and Engineering, Yonsei University, Seoul 03722, Republic of Korea

^c Department of Physics, School of Engineering, University of Petroleum and Energy Studies, Dehradun 248007, Uttarakhand, India

^d Department of Chemistry, Doodhsakhar Mahavidyalaya, Bidri, Kolhapur 416208, Maharashtra, India

^e Department of Physics, Ravi Luximihai Mahavidyalaya, Parola, Jalgaon 425111, Maharashtra, India

^f Department of Chemistry, Arts, Science, and Commerce College Ramanandnagar, Burti, Sangli 416308, Maharashtra, India

ARTICLE INFO

Keywords:

Spinel ferrite
Chemical co-precipitation method
Magnetic nanoparticles
Selectivity
Gas sensor

ABSTRACT

In this study, we fabricated zinc-substituted magnesium ferrite (MgFe_2O_4) (ZMF) nanoparticles with the general formula $\text{Zn}_x\text{Mg}_{1-x}\text{Fe}_2\text{O}_4$ ($x = 0.00\text{--}0.75$) using a surfactant-assisted co-precipitation method and evaluated their H_2S gas-sensing performance. Fourier-transform infrared and X-ray diffraction analysis results reveal the formation of a cubic spinel ferrite structure. The effect of zinc substitution on the physico-chemical properties of MgFe_2O_4 was studied and is discussed herein. The polycrystalline ZMF nanoparticles are magnetic and showed advantageous gas-sensing performance, the results of which reveal that they are sensitive to and selective for hydrogen sulfide (H_2S) gas. The ZMF gas sensors exhibited good sensing of various test gases/vapors, such as H_2S , H_2 , Cl_2 , carbon dioxide, liquid petroleum gas, ammonia, and ethanol while working at room temperature to 400°C . The $\text{Zn}_{0.5}\text{Mg}_{0.5}\text{Fe}_2\text{O}_4$ composition produced the highest response toward 10 ppm H_2S gas at 400°C operating temperature.

1. Introduction

Nowadays, gas sensors have garnered tremendous attention due to human safety concerns and environmental monitoring requirements. Recently, the daily air pollution has increased enormously due to rapid industrialization and many automobiles yielding numerous pollutants such as gases, volatile organic compounds, suspended particulate matter, etc. Therefore, researchers, engineers, and technocrats are determined to reduce air pollution by using different methods to detect, control, and reduce pollutants at their sources [1,2]. H_2S (hydrogen sulfide) is a highly toxic gas produced by various industrial effluent treatment plants, oil refineries, oil and natural gas drilling, Kraft paper mills, tanneries, thermal power plants, etc. and natural activities such as volcanic eruptions and anaerobic decomposition of organic waste [3,4]. The precise detection of H_2S gas during oil and gas drilling is needed to reduce the possibility of health hazards and explosions. Hence, developing gas sensors that can detect low concentrations of H_2S at around a few ppb or ppm is necessary to avoid the dangers of toxic gases.

Recently, the cubic spinel structure with the general formula AB_2O_4 (A^{2+} are divalent metal cations and B^{3+} are trivalent metal cations) of mixed metal oxide nanoparticles have produced the most promising materials due to their versatile and widespread application in the fields of biomedicine, electrochemical energy storage, magnetic recording media, high-frequency transformers, telecommunications, etc. [5–8]. Technologists are looking for easy, simple, efficient, and effective ways of synthesizing nanomaterials with large volume-to-size ratios and different shapes, sizes, compositions, and morphologies [9–11]. Choodamani et al. [12] reported the structural, morphological, dielectric, and magnetic properties of single cubic spinel zinc-substituted magnesium ferrite (MgFe_2O_4) synthesized using a solution-combustion method at a high sintering temperature of 1050°C . Magnesium-doped zinc ferrite is a promising material suitable for a variety of applications, such as in transformer cores, magnetic sorbents, biomedicine, photocatalysts, and gas and humidity sensors [13–16]. Various spinel ferrite nanoparticles have been synthesized in modern times using various techniques such as chemical co-precipitation [17,18], microwave combustion [19], hydrothermal [20], sol-gel [21], microemulsion [22],

* Corresponding authors.

E-mail addresses: hypark@yonsei.ac.kr (H.-H. Park), dnzambare1966@gmail.com (D.N. Zambare).

<https://doi.org/10.1016/j.mseb.2020.114776>

Received 26 June 2019; Received in revised form 3 August 2020; Accepted 1 September 2020
0921-5107/ © 2020 Elsevier B.V. All rights reserved.



Ultrasound-assisted, green and efficient synthesis of ferrocene-appended azo-phenothiazines

Varsha Kambale^a, Jagannath Jadhav, Ph D^b, Pravina Piste, Ph D^{a,*}

^a PG Department of Chemistry, A.S.C. College Ramanandnagar (Burl), Sangli, 416308, M.S., India

^b Department of Chemistry, Shivaji University, Kolhapur, 416004, M.S., India

ARTICLE INFO

Keywords:

Azo-phenothiazine
Diazotization reactions
Ultrasound irradiation
Antimicrobial activity

ABSTRACT

An effortless and highly efficient strategy for the synthesis of ferrocene-appended azo-phenothiazines (PHz's) under ultrasound irradiation has been developed. The said protocol allows for a more environmentally friendly approach, such as operationally simple, tolerates a wide range of functional groups compared to conventional methods, and is applicable on a gram scale without additional purification or other solvent waste. The synthesized compounds 6(a-c) were tested for their antimicrobial activity *in vitro*. Of all the compounds tested, 6a and 6da showed maximum antibacterial against *S. enteric* and *Bacillus cereus* as well as excellent antifungal activity against *A. flavus* and *A. fumigatus*.

1. Introduction

Phenothiazine (10H-dibenzo-[b,e]-1,4-thiazine; PHz) is an important fused tricyclic ring system belonging to the thiazine family. It was first prepared in the laboratory by the German chemist Bernthsen [1] in the course of proving the structure of violet and methylene blue by investigations according to the Lauth's method. Since then, it has played an important role in dye chemistry as the parent compound of thiazine dyes such as methylene green, thionine (Th), azure dye (AZ) and toluidine blue [2]. Indeed in the last twenty years, PHz and its derivatives have found numerous applications in other fields of electrochemistry [3], semiconductors [4] and chemical sensors [5], which stimulated further research on these compounds. Further it serves as pharmacophores for many molecules with significant biological and therapeutic value [6]. In particular, azo-phenothiazine and its derivatives have received considerable attention in recent years due to their considerable applications in various fields viz. medicine [7], solar cells [8], organic synthesis [9]. Some examples of azo-phenothiazines (Fig. 1) show promising antimicrobial [10], antifungal [11a], anticancer [11b], anti-inflammatory activities, reversal of multidrug resistance and many other effects [12]. Due to the attractive biological properties of azo-phenothiazines, the development of convenient synthetic methods from the readily available starting materials is very reasonable. In this context, the improvement of traditional diazotization and its coupling reaction in designing biologically active scaffolds by using simple, efficient and environment friendly

synthetic technique is an important challenge for the synthetic chemist.

In recent decades, ultrasonic irradiation has proven to be a very powerful and efficient bond formation technique in organic chemistry, providing a versatile and facile pathway for a variety of syntheses in the context of green chemistry. It is a promising alternative technique for modern organic syntheses and enables chemical transformations under the phenomenon of "cavitation", where gaseous and vaporous cavities of irradiated liquids expand, forms and implodes through enhancing mass transfer. In repertoire of studies, many diazo coupling reactions have been carried out under ultrasonic irradiation, offering higher yields, shorter reaction times and milder reaction conditions compared to conventional methods [13]. Indeed the diazo functionalization and structural modification on PHz, articulate very useful scaffolds for industrial and biological importance. However, there were no records in the literature where the PHz diazonium functionality was prepared and reacted directly to the metallocene ultrasonically (Scheme 1). Based on the experience of one of our authors [14] for the combined effect of metallocene-containing hybrids of heteroaromatic ring could confer labelled biological properties [15] as well as photoresponsive soft materials based applications. Thus in continuation of our efforts to develop new approaches for the design and synthesis of S/N-containing heterocyclic diazo compounds, we hypothesized rapid, more practical and eco-friendly ultrasonication technique for the preparation of pendant ferrocenyl phenothiazine azo dyes. The key theme of our synthetic strategy is the construction of drug-like molecular libraries through the creative reconstruction of core skeletons with privileged substituents.

For the feasibility of our chosen approach, it is primarily important to find a suitable diazotizing agent that works under ambient conditions for numerous amino compounds and promotes the azo-coupling reaction of

* Corresponding author.

E-mail address: ppiste321@gmail.com (P. Piste).

<https://doi.org/10.1016/j.crgsc.2021.100125>

Received 31 January 2021; Received in revised form 25 May 2021; Accepted 30 May 2021

Available online 8 June 2021

2666-0865/© 2021 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

संत तुकारामांचे कूटकाव्य व त्याचा चिकित्सक अभ्यास

प्रा. दिलीप महादू कोने

सहयोगी प्रध्यापक व मराठी विभागप्रमुख

आर्ट्स, सायन्स अँड कॉमर्स कॉलेज, यमानंदनगर (बुर्ली), ता. पलूस, जि. सांगली

मराठी साहित्यात ओवीतील सात्विकतेपासून लावणीतील रसिकतेपर्यंत मानवी जीवनाच्या अनेक वृत्ती व प्रवृत्तींचे दर्शन घडते. हे दर्शन घडविण्यासाठी संतांनी ओवी, अभंग, गवळणी, भारुडे, विरहण्या इत्यादी रचना प्रकार उपयोगात आणले. यामधून त्यांनी आपली आध्यात्मिक अनुभूती व ईश्वराचे चराचरातील अस्तित्व सामान्य जणांना समजावून सांगितले आहे. समजावून देण्याच्या भूमिकेत कूटकाव्य हा रचनाप्रकार निर्माण झाला असल्याचे दिसून येते.

कूटकाव्याचे स्वरूप -

प्राचीन काळापासून सुसंस्कृत आणि असंस्कृत अशा दोन्ही समाजात कूट प्रश्नांचा उपयोग केला आहे. प्राचीन भारतीय वाङ्मयाप्रमाणे अनेक लौकिक विषयात तत्त्वज्ञानात व उपदेशात्मक वाङ्मयात कूटप्रश्न आढळतात. उदा. सर्वात कठीण गोष्ट कोणती ? याचे सर्वसामान्य उत्तर लोखंड, परंतु हे त्याचे उत्तर नाही कारण लोहार लोखंडाला नरम करतो. पण प्रेम हे सर्वांना नरम करते म्हणून प्रेम हेच त्याचे समर्पक उत्तर आहे.

कूट म्हणजे काय ?

अमर कोषात कूट शब्दाचे नऊ अर्थ दिली आहेत. ते म्हणजे माया, निश्चल, यंत्र, कपट, खोटे, राशि, हाथौडा, शैलभृंग, सीरांग या विविध अर्थासाठी वापरला आहे.

संस्कृत कौस्तुभमध्ये कूट शब्दाचा अर्थ मिथ्या, दुष्ट, कपट, छल, धोका, माया, चलाखी, विषय, प्रश्न, जालसाची, विलुप्तपणा असा दिलेला आहे.

मराठी शब्दकोषात मीरपूड, वाळलेल्या तांदळातील बारीक कण, माशाचा तुकडा, अर्धवट बारीक शिजवलेली पातळ भाजी, रस्सा, लबाडी, कपट, निंदा, कोडे, गुप्त मंडळ, एकमेकांनी केलेलीमसलत असा दिला असून कूट हा शब्द जेव्हा एखाद्या शब्दाच्या अगोदर येतो तेव्हा त्या शब्दाचा वळण मिळते. उदा. कूटनीती, कूटशासन, कूटसाक्षी इत्यादी.

अशाप्रकारे कूट शब्दाचे वेगवेगळे अर्थ आपण पाहिले. या सर्व संदर्भावरून असे म्हणता येते की, प्रत्येक ग्रंथकाराने कूट शब्द वेगवेगळ्या अर्थाने दिलेला आहे. पण कूट या शब्दाचा नेमका अर्थ सांगण्याचा प्रयत्न कोणीही केलेला नाही. म्हणजेच कूट हा शब्द कपट भासमान कोडे, विपरित शब्दाचा प्रश्न या अर्थाने अनेक ग्रंथकारांनी वापरला आहे.

११. डॉ. बाबासाहेब आंबेडकरांचे स्त्रियांबाबतचे कार्य

प्रा. कोने दिलीप महादू

मराठी विभाग प्रमुख व सहयोगी प्राध्यापक, आर्ट्स, सायन्स अँड कॉमर्स कॉलेज, रामानंदनगर (बुर्ली) ता. पलूस, जि. सांगली.

डॉ. बाबासाहेब आंबेडकर हे स्त्रीमुक्तीचे कट्टर समर्थक होते. त्यांच्या मते कोणत्याही समाजाचे मूल्यमापन हे त्या समाजातील स्त्रियांची परिस्थिती कशी आहे. यावरून करता येते. समाजाने स्त्रियांच्या विकासाकडे लक्ष देणे गरजेचे आहे. असे त्यांचे मत होते. प्रत्येकाने आपल्या घरातील मुलीला शिक्षण दिले पाहिजे अशी त्यांची भूमिका होती. ब्राह्मणांच्या मुली जितक्या शिकतील तितक्या दलितामधील मुली शिकल्या पाहिजे असे विचार ते त्यावेळी मांडत होते. स्त्रियांच्या हक्कासाठी असलेले 'हिंदूकोडबिल' नेहरूंच्या नेतृत्वातील मंत्रीमंडळाने पास केले नाही म्हणून डॉ. आंबेडकरांनी कायदा मंत्रीपदाचा २७ सप्टेंबर १९५१ ला राजिनामा दिला होता. ही दुर्दैवाची गोष्ट होय.

भारतीय परंपरेने स्त्रीला कायमच बंधनात ठेवले होते. तिने बालपणी पित्याच्या, तरुणपणी पतीच्या आणि म्हातारपणी पुत्राच्या अधिपत्याखाली राहणे अशी व्यवस्था होती. णनुने व मनुवाद्यांनी स्त्रीला दोषी ठरवले होते. म्हणून डॉ. आंबेडकरांनी २५ डिसेंबर १९२७ रोजी 'मनुस्मृती' दहन केले. हा दिवस स्त्रीमुक्ती दिन म्हणूनही पाळला जातो. हिंदू लोकांत स्त्री म्हणजे एक पुरुषांच्या चैनीची वस्तू आहे. असा सर्वसाधारण समज आहे; आणि पुरुषांच्या इच्छेनुसार स्त्रियांनी वागावे अशी समजूत होती. पण तिला कोणत्याच प्रकारचे हक्क देण्यात आले नव्हते. संपत्तीचा वारसा नाही, की मन सुसंस्कृत करण्यासाठी शिक्षणाचाही अधिकार नाही म्हणून डॉ. बाबासाहेबांनी हिंदूकोड बिलाच्या माध्यमातून स्त्रियांना कायद्याने हक्क, दर्जा आणि प्रतिष्ठा प्राप्त करून देण्यासाठी हे पुढील सात घटक खूप महत्वाचे होते. १) जी व्यक्ती मृत्युपत्र न करता मृत पावली असेल अशा मृत व्यक्तीच्या (स्त्री आणि पुरुष दोघांच्याही) मालमत्तेच्या हक्काबाबत. २) मृताचा वारसदार ठरविण्याचा अधिकार. ३) पोटगी ४) विवाह ५) घटस्फोट ६) दत्तकविधान ७) अज्ञानत्व व पालकत्व हे सात विषय महत्वाचे होते. पण हिंदू स्त्रियांना त्यांचे न्याय हक्क देण्यास विरोध झाला, ही अतिशय दुर्दैवी बाब होती. या बिलातील घटस्फोट, द्विभार्या व कलमांना सनातनी मनोवृत्तीच्या लोकांनी प्रचंड विरोध केला होता.

डॉ. आंबेडकरांनी संविधानाचे ऐतिहासिक कार्य केले आहे. ज्या तत्वांचा, मूल्यांचा त्यांनी संविधानात जोरदार पुरस्कार केला आहे. हिंदूकोड बिलाचे चार वेगवेगळे भाग करून हे चारही भाग पंडित नेहरूंनी मंजूर करून घेतले. १९५५-५६ मध्ये मंजूर झालेले चार कायदे असे - (१) हिंदू विधवा कायदा. (२) हिंदू वारसा हक्क कायदा. (३) हिंदू अज्ञान व पालकत्व कायदा. (४) हिंदू दत्तक व पोटी कायदा. हे कायदे मंजूर होणे म्हणजे कायद्याच्या इतिहासातील हक्क क्रांतीकारक घटना होती. या कायद्याने भारतीय स्त्रियांच्या जीवनात आमूलाग्र परिवर्तन घडण्यास सुरुवात झाली. या कायद्यांनी स्त्री-पुरुषांच्या दर्ज्यात समानता प्रस्थापित झाली आहे.



'काय डॅंजर वारा सुटलाय !' या नाटकाचे परीक्षण

प्रा. दिलीप महादू कोने

सहयोगी प्राध्यापक, मराठी विभाग प्रमुख

आर्ट्स, कॉमर्स अँड सायन्स कॉलेज, रामानंदनगर (बुर्ला), ता. पलूस जि. सांगली

जयंत पवार हे १९९० नंतरच्या कालखंडातील सुप्रसिद्ध कथाकार व नाटककार म्हणून परिचित आहेत. त्यांना 'फिनिक्सच्या राखेतून उठला मोर' या कथासंग्रहासाठी २०१२ मध्ये साहित्य अकादमीचा पुरस्कारही मिळाला आहे. जयंत पवार लिखित 'काय डॅंजर वारा सुटलाय!' हे नाटक महानगरीय स्तरावरील प्रकाश टाकते, त्याबरोबरच कला, साहित्य, संस्कृती, इतिहास, भाषा हे सारेच कसे सांगलीचे भ्रष्ट बनत चालले आहे याची करुणार्त कहाणी आपल्यासमोर मांडतात याचा पत्त्यय या नाटकातून येतो.

जयंत पवार यांनी या नाटकात एका गरीब मध्यमवर्गीय माणसाचे आणि त्याच्या कुटुंबाचे सारे अस्मिता व योजनाबद्धरीतीने, थंड डोक्याने पण अत्यंत क्रूरपणे कसे उध्वस्त केले जाते; याची निरनिराळी कहाणी सांगितली आहे. नाटकाच्या शीर्षकापासूनच या नाटकाला प्रतिकात्मकता लाभली आहे. त्याहीन माणुसकीशून्य, हिंसेचा सार्वत्रिक पूरस्कार करणारा, डॅंजर वारा आपल्या एकूणच जीवनावर घोंगावू लागला आहे. सुखासमाधानाने जगणाऱ्या माणसाचे जीवन निर्दयपणे, अत्यंत क्रूरपणे उध्वस्त करत सुटला आहे. अशा प्रतिकात्मक अर्थानेही हे नाटक सरस आहे.

माणसाच्या आयुष्यात काय हवे असते? एक साथे सरळ, सुखी आयुष्य जगावे, आपले कुटुंबाचे एक लहानसे का होईना घर असावे, इतक्या माफक सुखाची अपेक्षा करत बहुतेक माणसे आयुष्यभर राहत राहतात. पण स्वतःच्या कष्टातून उभ्या केलेल्या हया छोट्याशा सुखावरही त्यांचा आस्वाद नसतो. मदोन्मत सत्ताधऱ्यांच्या एका आदेशासरशी केव्हाही आपण लुबाडले जाऊ, हे भय आयुष्यभर इथे माणसाला जगावे लागते. 'काय डॅंजर वारा सुटलाय!' हया शीर्षकापासूनच हया भयाची छाया जाणवते. येऊ घातलेल्या वादळाची आणि त्यानंतरच्या उध्वस्ततेची चाहूल नाटकाच्या सुरुवातीपासूनच असा आपला कब्जा घ्यायला सुरुवात करते.

महानगरात अर्थात मुंबईत आपले सारे आयुष्य इमानेइतबारे वेचलेल्या एका सत्यविजय नरहरी नावाच्या माणसाची हकीकत या नाटकात अत्यंत नाट्यमय पण काळीज हेलावणाऱ्या पद्धतीने सांगितली आहे. हा माणूस 'कुसुमकुंज' या सोसायटीत रहात असतो. व्यवसायाने नोकरदार असून ते मधून पोटापाण्यासाठी मुंबईत आलेले आहेत. लाईफ इन्शुरन्स कंपनीत नोकरी करतात. त्यांना ते सेवानिवृत्त झालेले आहेत. लोकांच्या पॉलिसी उतरविणे आणि त्यातून मिळणाऱ्या पैसे ते घरेखर्च भागवितात. दाभाडे, त्यांची बायको, मुलगा बंटी आणि मुलगी चिंगी असे हे कुटुंब असते. कोणाच्या अध्यात ना मध्यात नसलेले. दाभाडे मूळचे मध्यप्रदेशातील इंदौरचे.

Impact Factor-7.675 (SJIF)

ISSN-2278-9308

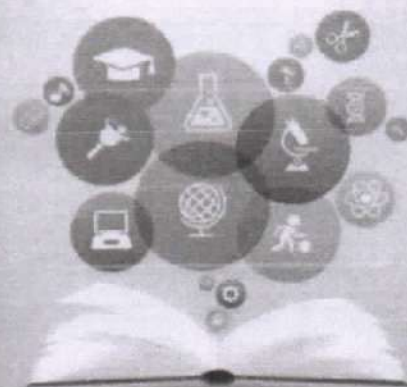
B. Aadhar

Peer-Reviewed & Refreed Indexed

Multidisciplinary International Research Journal

May -2021

ISSUE No- (CCLXX) 292



Chief Editor

Prof. Virag S. Gawande
Director
Aadhar Social
Research & Development
Training Institute Amravati

Editor:

Dr.Dinesh W.Nichit
Principal
Sant Gadge Maharaj
Art's Comm,Sci Collage,
Walgaon.Dist. Amravati.

Executive Editor:

Dr. Sanjay J. Kothari
Head, Deptt. of Economics,
G.S. Tompe Arts Comm. Sci. Collage,
Chandur Bazar Dist. Amravati



This Journal is indexed in :

- Scientific Journal Impact Factor (SJIF)
- Cosmos Impact Factor (CIF)
- International Impact Factor Services (IIFS)

For Details Visit To : www.gadharsocial.com

Aadhar PUBLICATIONS

**INDEX**

No.	Title of the Paper	Authors' Name	Page No.
1	महीलांचे राजकीय सक्षमीकरण — एक चिकीत्सक अध्ययन प्रा.डॉ. सुभाष दौलतराव उपाते		1
2	संत तुकारामाची नीतीमूल्ये	प्रा.डॉ. अजय कृ. खडसे	8
3	बाबासाहेब आंबेडकर यांचे शिक्षण विषयक विचार	प्रा.डॉ. सुरेश पंडित	13
4	भंडारा जिल्ह्यातील उपलब्ध मुलभूत सुविधा	डॉ. एस.एच. भैरम	16
5	अनुबंध खेती से होनेवाले लाभ एवं हानी का विश्लेषणात्मक अध्ययन प्रा.डॉ. ए.बी.पटले		19
6	भारतीय आदिवासींच्या समस्या.	डॉ. दामोदर सी. दुधे	24
7	भारतीय अर्थव्यवस्थाका मुल्यांकन एवं संभावनाए डॉ. केशव सुर्यभानसा गुल्हाने		28
8	महात्मा गांधी यांच्याजीवनमूल्यांचा अभ्यास गणेश मधुकर बुट्टे / डॉ. अमोल मांडेकर		31
9	महात्मा गांधी : विचारविश्व आणि ग्रामसुधारणा	डॉ.गवरांम नाना पोटे	36
10	✓ 'प्रकाशवाटा' या आत्मचरित्राचा घेतलेला शोध	प्रा. दिलीप महादू कोने	40
11	भक्ती काव्याची अभिव्यक्ती : अर्भगवाणी प्रसिध्द तुक्याची प्रा. छत्रपाल श्रीपतराव लांबकाने		44
12	दिव्यांगांच्या समस्या आणि कायद्यात्मक तरतुदी	सुहास वाघमारे	49
13	महाराष्ट्रातील नक्षलवादी विचारसरणी स्वरूप ,दृष्टिकोन आणि वाटचाल यांचे अध्ययन प्रा.डॉ.नारायण पोहकर		52
14	भारतीय कृषी व्यवस्था व चळवळी—एक ऐतहासिक दृष्टीकोन Dr.Prakash Pawar		55
15	आदिवासी विकास आणि पंचायतराज संस्था अंकुश माणिक सोनुने / महेंद्र सर्जेराव महानोर		59
16	मैत्रेयी पुष्पा के उपन्यासों में ग्रामीण जीवन का परिदृश्य	निशा साहनी	63
17	Critical Analysis of the Implementation of Right to Education under Article 21A of the Constitution through Right to Education Act 2009 Prof.Shweta Shiraskar		66
18	Awareness About Environment Through The Education And Literature Dr. Ajaykumar S. Mohobansi		70



'प्रकाशवाटा' या आत्मचरित्राचा घेतलेला शोध

प्रा. दिलीप महादू कोने

सहयोगी प्राध्यापक व मराठी विभाग प्रमुख, डॉ. पतंगराव कदम महाविद्यालय,
रामानंदनगर (बुर्ली) पो. किलोस्करवाडी ता. पलूस, जि. सांगली- 416 308

मो. नं. 9922885186 ईमेल: dilipkone02@gmail.com

कथा, कविता, कादंबरी आणि नाटक हे मराठीतील चार प्रमुख वाङ्मयप्रकार आहेत. याशिवाय चरित्र, आत्मचरित्र, प्रवासवर्णन, लघुनिबंध अशा अन्य वाङ्मयप्रकारांनी मराठी वाङ्मय बहरले आहे. आजच्या काळात उत्तरोत्तर लोकप्रिय होत जाणारा साहित्यप्रकार म्हणजे आत्मचरित्र होय.

"स्वतःच्या आयुष्याची स्वतःच सांगितलेली सुसंगत माहिती म्हणजे आत्मचरित्र होय". असे वेबस्टरने म्हटले आहे. तर "व्यक्तीच्या जीवनाचा, व्यक्तीमत्वाचा व कर्तृत्वाचा त्याने स्वतःच लिहिलेला इतिहास म्हणजे आत्मचरित्र होय". असे चार्ल्स डफी यांनी म्हटले आहे. तसेच "आत्मचरित्र म्हणजे स्वतःच्या जीवनाची स्वतः लिहिलेली कहाणी होय". हे डॉ. बोरगावकर यांनी म्हटले आहे. "स्वतःच्या जीवनाचे दुरस्थपणे सिंहावलोकन वृत्तीने केलेले अवलोकन आणि त्याविषयी प्रांजळ निवेदन म्हणजे आत्मचरित्र होय". असे सदा क-हाडे यांनी म्हटले आहे. पण खरे पाहता "स्वतःच्या जीवनातील आशाआकांक्षा, यशापयश, हर्षमर्ष, अनुभव यांचा तटस्थपणे स्वतःच मांडलेला सत्याधारित लेखाजोखा म्हणजे आत्मचरित्र होय".

डॉ. प्रकाश आमटे यांनी आपण आयुष्यात जे केले ते इतरांना मार्गदर्शक व्हावे अशी अपेक्षा ठेवून आपल्या कर्तृत्वाच्या प्रेरणेने दुस-याला प्रेरित करावे अशी इच्छा असल्याने 'प्रकाशवाटा' या आत्मचरित्राचे लेखन केले आहे. थोरामोठ्यांचे जीवन हे दीपस्तंभासारखे असते. त्या प्रकाशात इतरांना वाटचाल करता यावी ही प्रांजळ व प्रामाणिक इच्छा आहे. सत्य हे आत्मचरित्राचे हृदय असते.

'प्रकाशवाटा' या संपूर्ण पुस्तकात डॉ. प्रकाश आमटे यांनी त्यांचे जीवनचरित्र उलगडले आहे. वडील प्रसिद्ध समाजसुधारक बाबा आमटे यांनी आनंदवन येथे कुष्ठरोग्यांसाठी उभारलेले काम, यापासून प्रेरणा घेऊन डॉक्टर असूनही पैसा कमवणे हा उद्देश न ठेवता प्रकाश आणि बंधू विकासने स्वतः उभे केलेले काम, गडचिरोली जिल्ह्यात हेमलकसा येथे येऊन आदिवासींना आत्मभान देण्यासाठी, त्यांना मोफत वैद्यकीय उपचार, शिक्षण देण्यासाठी आयुष्यभर डॉ. प्रकाश आमटे व पत्नी डॉ. मंदा आमटे आणि सहकारी यांनी केलेले अथक परिश्रम, मोठ्या प्रेमाने उभारलेले अनाथ प्राण्यांचे गोकूल, मिळालेले अनेक मानसन्मान व पुरस्कार, अनेक लोकांनी उदारहस्ते केलेली आर्थिक व अन्य मदत, पुढच्या पिढीनेही हेच काम करायचे ठरवल्याने झालेले समाधान हा सगळा प्रवास डॉ. प्रकाश आमटे यांनी कोणताच आडपडदा न ठेवता मांडला आहे.

महाराष्ट्रातील सुप्रसिद्ध सामाजिक कार्यकर्ते डॉ. प्रकाश आमटे यांचे वडील सुप्रसिद्ध बाबा आमटे म्हणजेच मुरलीधर देवीदास आमटे हे असून सौ. साधना आमटे या त्यांच्या मातोश्री आहेत. डॉ. प्रकाश आमटे यांचा जन्म 26 डिसेंबर 1948 रोजी बरोडा येथे आनंदवनात झाला आहे. डॉ. मंदाकिनी आमटे या त्यांच्या पत्नी असून डॉ. दिगंत, अनिकेत आणि आरती ही त्यांची मूले आहेत. डॉ. विकास आमटे हे त्यांचे थोरले बंधू आहेत.

Thin $\text{Zn}_{1-x}\text{Mn}_x\text{O}$ Films ($x = 1\text{--}4\text{ at } \%$) by Chemical Bath Deposition: Influence of Dopant Concentration

G. R. Patil^a, M. B. Shelar^{a,*}, N. J. Kambale^a, L. D. Kadam^a, V. S. Raut^a, and B. N. Pawar^c

^a Department of Physics, Dr. Patangrao Kadam Mahavidyalaya, Ramanandnagar, Sangli (affiliated to Shivaji University), Maharashtra, India

^b Thin Film Materials Laboratory, Department of Physics, D.Y. Patil College of Engineering and Technology, Kolhapur (affiliated to Shivaji University), Maharashtra, India

^c Department of Physics, Bharati Vidyapeeth Deemed University, Yashwantrao Mohite College, Pune, Maharashtra, India

*e-mail: maheshshelar29@gmail.com

Received January 10, 2021; revised February 27, 2021; accepted March 3, 2021

Abstract—Thin films of $\text{Zn}_{1-x}\text{Mn}_x\text{O}$ ($x = 1\text{--}4\text{ at } \%$) were applied onto a glass substrate by low-cost chemical bath deposition (CBD). The films were characterized by XRD, UV–VIS absorption spectra, SEM, and vibrating sample magnetometry—with special emphasis on the influence of dopant concentration x . Structural and optical properties of deposited films imply that the Mn^{2+} ions substituted Zn^{2+} ions without changing the wurtzite structure of ZnO. No impurity phases were detected in XRD patterns. The band gap in ZnO was found to increase with increasing x . Magnetic measurements showed that Mn-doped ZnO samples exhibited ferromagnetic behavior at room temperature, which tentatively was associated with the replacement of Zn^{2+} ions by Mn^{2+} ions in the ZnO lattice.

Keywords: thin Mn-doped ZnO films, chemical bath deposition (CBD), optical properties, ferromagnetism

DOI: 10.3103/S1061386221020096

1. INTRODUCTION

Over the past two decades, diluted magnetic semiconductor materials have attracted much attention as an excellent media in which both the charge (electron and holes) and spin related phenomena take place in a one and the same substance, which is an important property for spintronic devices [1]. Due to a large exciton binding energy of ZnO, some zinc ions can be replaced by magnetic ions capable of ferromagnetic coupling [2]. Among other transition metals, ZnO doping with Mn seems most encouraging because Mn has a highest possible magnetic moment [3], and the first half of the d -band is fully occupied, thus promoting the formation of a stable fully polarized state. In addition, Mn is isomorphic to Zn and exhibits variable oxidation state and acceptor properties in a ZnO matrix since the ionic radius of Zn^{2+} (0.74 Å) is smaller than that of Mn^{2+} (0.80 Å) and larger than that of Mn^{3+} (0.66 Å).

There are continuing efforts to elucidate the origin of the observed ferromagnetism in Mn-doped ZnO [4] and the Mn^{2+} -induced room-temperature ferromagnetism and spin-glass behavior in hydrothermally grown Mn-doped ZnO nanorods [5] where the ferromagnetic ordering got stabilized upon an increase in hole concentration. Wojnarowicz et al. [6] studied the

structural and magnetic properties of Co–Mn co-doped ZnO nanoparticles obtained by microwave solvothermal synthesis. Yan et al. [7] described Mn-doped ZnO nanorod arrays prepared by CVD method with ferromagnetic ordering above room temperature. Droubay et al. [8] synthesized Mn-doped ZnO epitaxial thin films at different temperatures and achieved room temperature ferromagnetism in the samples synthesized at 950°C. Sample preparation and annealing effects on the ferromagnetism in Mn-doped ZnO can be found in [9].

To date, bulk samples and thin films of Mn-doped ZnO have been prepared by different methods such as sol–gel [10], radiofrequency magnetron sputtering [11], pulsed laser deposition [12], and spray pyrolysis [13]. Ferromagnetism in different $(\text{ZnO})_{1-x}(\text{MnO}_2)_x$ systems still remains controversial and the magnetic properties of oxide films were found highly sensitive to preparation method [14, 15].

In this communication, we report on the preparation of thin $\text{Zn}_{1-x}\text{Mn}_x\text{O}$ films ($x = 1\text{--}4\text{ at } \%$) by low-cost chemical bath deposition (CDD) method and their characterization, with special emphasis on the influence of dopant concentration x .



Magnetically Recoverable BiVO₄/NiFe₂O₄ Nanocomposite Photocatalyst For Efficient Detoxification of Polluted Water Under Collected Sunlight

P.A. Sakhare^a, S.S. Pawar^a, T.S. Bhat^{a,b}, S.D. Yadav^a, G.R. Patil^c, P.S. Patil^{a,b}, A.D. Sheikh^{a,*}

^a School of Nanoscience and Technology, Shivaji University, Kolhapur, 416 004, M. S., India

^b Thin Film Materials Laboratory, Department of Physics, Shivaji University, Kolhapur, 416 004, M. S., India

^c Department of Physics, Arts, Science and Commerce College, Ramanandnagar (Burl), Sangli, 416 308, M. S., India

ARTICLE INFO

Keywords:

Photocatalysis
Collected sunlight
Bismuth vanadate
Magnetic nanoparticles
Dye degradation

ABSTRACT

Present work focused on the photocatalytic activity of NiFe₂O₄ (NFO), BiVO₄ (BVO) and BiVO₄/NiFe₂O₄ (BVO/NFO) composite nanoparticles under natural and collected sunlight. Among the samples, BVO/NFO photocatalyst shown 95 % and 98 % degradation of Methylene blue (MB) in 240 min of natural and 30 min of collected sunlight illumination respectively. Thus BVO/NFO composite shows superior photodegradation performance under collected sunlight irradiation compared to natural sunlight which is accredited to the efficient light absorption and low recombination of the photoexcited charge carriers. Furthermore, the BVO/NFO composite nanoparticles was magnetically-retrievable for sequential recycling by applied magnetic field. The XRD measured before and after sequential recycling BVO/NFO composite reveal that present photocatalyst has excellent photochemical stability as it repeatedly degrades MB over 95 %, even after four cycles of the photocatalysis process. This study would offers a potential route for exploration of the photocatalytic performance of BVO/NFO nanoparticles under collected sunlight.

1. Introduction

The rapid development of various sectors come up with huge industrialization started to drain non-degradable and biologically hazardous organic compounds in the environment [1,2]. Semiconductor-based photocatalysis has received intense attention on the viewpoint of solar energy utilization for environmental purification [3]. Recently, researchers have attempted to by optimizing several synthesis parameters and materials structural, morphology, optical absorption, surface area to volume ratio, and electronic charge transport properties to obtain high-performance visible-light-induced efficient photocatalytic degradation of organic pollutants [4–6]. The BiVO₄ (BVO) is a typical ternary semiconductor compound with a layered structure that can exist in three crystal structures, including tetragonal scheelite, monoclinic scheelite, and tetragonal zircon [6]. As per literature, it was recognized that among these crystal structures BVO with monoclinic structure shows efficient photocatalytic degradation of toxic dyes [7]. The promising photocatalytic activity of BVO nanoparticles under visible-light irradiation is because of its low bandgap of 2.4 eV, high dispersibility in liquids, non-toxic nature, and high resistance against photochemical corrosion [8–10]. As far as pristine BVO is concerned, Yin et al. [11] reported efficient degradation of RhB under 20 min of

illumination representing the shortest time of photodegradation compared to other reports on BVO. However, several modifications in the BVO photocatalyst have been studied to increase the optical absorption in the visible region, enhance the photocatalytic activity and improve the photochemical stability. In this prospect, much efforts have been made by doping different metals like Sulphur (S) [10], Boron (B) [12], Fluorine (F) [13], Silver (Ag) [14], Copper (Cu) [14,15], Cobalt (Co) [16], and Nickel (Ni) [17] in BiVO₄. Further, the composite of BVO with r-GO [18–20] and g-C₃N₄/BVO [21–22] also reported in the literature. Apart from this, with suitable band positions for charge transport, BVO composites with different types of semiconducting metals oxides like TiO₂ [23], Cu₂O [24,25], Bi₂WO₆ [26,27] and GeO₂ [28] has been reported in the literature.

Based on the above literature survey, it was realized that the entire efforts focused on different ways to enhance the photodegradation performance of BVO based photocatalyst. However, a serious difficulty has encountered regarding the separation of BVO nanoparticles from solution once the photodegradation process completed to fulfil the purpose of reuse or recycle photocatalyst. For practical dye degradation applications, only efficient photocatalyst is not enough but recycling the entire process is equally important. As BVO is a non-magnetic and therefore it is not possible to separate the BVO photocatalyst dispersed

* Corresponding author.

E-mail address: arifdshikh@gmail.com (A.D. Sheikh).

<https://doi.org/10.1016/j.materresbu.2020.110908>

Received 18 February 2020; Received in revised form 15 April 2020; Accepted 25 April 2020

Available online 28 April 2020

0025-5408/ © 2020 Elsevier Ltd. All rights reserved.

13
14

Thin $\text{Zn}_{1-x}\text{Mn}_x\text{O}$ Films ($x = 1\text{--}4$ at %) by Chemical Bath Deposition: Influence of Dopant Concentration

G. R. Patil^a, M. B. Shelar^{b,*}, N. J. Kambale^a, L. D. Kadam^a, V. S. Raut^a, and B. N. Pawar^c

^a Department of Physics, Dr. Patangrao Kadam Mahavidyalaya, Ramanandnagar, Sangli (affiliated to Shivaji University), Maharashtra, India

^b Thin Film Materials Laboratory, Department of Physics, D.Y. Patil College of Engineering and Technology, Kolhapur (affiliated to Shivaji University), Maharashtra, India

^c Department of Physics, Bharati Vidyapeeth Deemed University, Yashwantrao Mohite College, Pune, Maharashtra, India

*e-mail: maheshshelar29@gmail.com

Received January 10, 2021; revised February 27, 2021; accepted March 3, 2021

Abstract—Thin films of $\text{Zn}_{1-x}\text{Mn}_x\text{O}$ ($x = 1\text{--}4$ at %) were applied onto a glass substrate by low-cost chemical bath deposition (CBD). The films were characterized by XRD, UV–VIS absorption spectra, SEM, and vibrating sample magnetometry—with special emphasis on the influence of dopant concentration x . Structural and optical properties of deposited films imply that the Mn^{2+} ions substituted Zn^{2+} ions without changing the wurtzite structure of ZnO. No impurity phases were detected in XRD patterns. The band gap in ZnO was found to increase with increasing x . Magnetic measurements showed that Mn-doped ZnO samples exhibited ferromagnetic behavior at room temperature, which tentatively was associated with the replacement of Zn^{2+} ions by Mn^{2+} ions in the ZnO lattice.

Keywords: thin Mn-doped ZnO films, chemical bath deposition (CBD), optical properties, ferromagnetism

DOI: 10.3103/S1061386221020096

1. INTRODUCTION

Over the past two decades, diluted magnetic semiconductor materials have attracted much attention as an excellent media in which both the charge (electron and holes) and spin related phenomena take place in a one and the same substance, which is an important property for spintronic devices [1]. Due to a large exciton binding energy of ZnO, some zinc ions can be replaced by magnetic ions capable of ferromagnetic coupling [2]. Among other transition metals, ZnO doping with Mn seems most encouraging because Mn has a highest possible magnetic moment [3], and the first half of the d -band is fully occupied, thus promoting the formation of a stable fully polarized state. In addition, Mn is isomorphic to Zn and exhibits variable oxidation state and acceptor properties in a ZnO matrix since the ionic radius of Zn^{2+} (0.74 Å) is smaller than that of Mn^{2+} (0.80 Å) and larger than that of Mn^{3+} (0.66 Å).

There are continuing efforts to elucidate the origin of the observed ferromagnetism in Mn-doped ZnO [4] and the Mn^{2+} -induced room-temperature ferromagnetism and spin-glass behavior in hydrothermally grown Mn-doped ZnO nanorods [5] where the ferromagnetic ordering got stabilized upon an increase in hole concentration. Wojnarowicz et al. [6] studied the

structural and magnetic properties of Co–Mn co-doped ZnO nanoparticles obtained by microwave solvothermal synthesis. Yan et al. [7] described Mn-doped ZnO nanorod arrays prepared by CVD method with ferromagnetic ordering above room temperature. Droubay et al. [8] synthesized Mn-doped ZnO epitaxial thin films at different temperatures and achieved room temperature ferromagnetism in the samples synthesized at 950°C. Sample preparation and annealing effects on the ferromagnetism in Mn-doped ZnO can be found in [9].

To date, bulk samples and thin films of Mn-doped ZnO have been prepared by different methods such as sol–gel [10], radiofrequency magnetron sputtering [11], pulsed laser deposition [12], and spray pyrolysis [13]. Ferromagnetism in different $(\text{ZnO})_{1-x}(\text{MnO}_2)_x$ systems still remains controversial and the magnetic properties of oxide films were found highly sensitive to preparation method [14, 15].

In this communication, we report on the preparation of thin $\text{Zn}_{1-x}\text{Mn}_x\text{O}$ films ($x = 1\text{--}4$ at %) by low-cost chemical bath deposition (CDD) method and their characterization, with special emphasis on the influence of dopant concentration x .

PAPER • OPEN ACCESS

Synthesis of N-Mannich bases from 3, 4-dihydropyrimidin-2(1H)-ones by using nanostructured Cobalt Chloride Doped Polyaniline Composite as Catalyst (PANI-Co)

To cite this article: Deepak M. Nagrik and Umesh S. Shelke 2020 *J. Phys.: Conf. Ser.* **1644** 012018

View the [article online](#) for updates and enhancements.



IOP ebooks™

Bringing together innovative digital publishing with leading authors from the global scientific community.

Start exploring the collection—download the first chapter of every title for free.

Synthesis of N-Mannich bases from 3, 4-dihydropyrimidin-2(1H)-ones by using nanostructured Cobalt Chloride Doped Polyaniline Composite as Catalyst (PANI-Co)

Deepak M. Nagrik¹, Umesh S. Shelke²

¹Department of Chemistry, G. S. Science, Arts and Commerce College, Khamgaon, Buldana (M.S.) India-444303

²Department of Chemistry, Arts, Science and Commerce College, Ramanandnagar, Burli, (M.S.) India-416308

Corresponding author e-mail : dmnnagrik@gmail.com

Abstract: The Mannich reaction is the type proton assisted of carbon-carbon bond formation reaction that involves the addition of resonance-stabilized carbon nucleophiles to iminium salts and imines. The product of the Mannich reaction is β -amino carbonyl compounds of biological interest synthesized from the aldehyde, amine, and carbonyl compounds. This reaction is very limited to the only highly reactive aldehydes such as formaldehyde and acetaldehyde, a secondary amine. The direct Mannich-type reaction expanded with the development of the scope of Mannich reaction, and very much efficient method for highly stereo selective type Mannich reactions were extensively well studied and reported in the literature. This study aimed at investigating the synthesis of N-Mannich Bases from the 3, 4-Dihydropyrimidin-2(1H)-ones by using nanostructure Cobalt Chloride Doped Polyaniline composite as Catalyst (PANI-Co). The Synthesis of N-Mannich Bases from 3, 4-Dihydropyrimidin-2(1H)-ones by using nanostructure Cobalt Chloride Doped Polyaniline composite as Catalyst (PANI-Co) was carried out. The effective method for the synthesis of the Mannich bases of synthetically important compounds has been coined. We synthesized the different Mannich Bases from 3, 4-Dihydropyrimidin-2(1H)-ones which give up to 94 % yield.

1. Introduction

The end product of the Mannich reaction is beta amino compound [1-2]. The Mannich reaction is a type of nucleophilic addition reaction in the condensation of a compound with active hydrogen(s) with primary or secondary amine and formaldehyde [3]. The general schematic representation of Mannich reaction is given in fig. 1. The Mannich bases has found to be the great synthetic important and it acts as a biologically active compound and it is a potential agents for the synthesis of various medically valuable compounds which composes the amino alkyl chain in it. The amino alkyl chain containing mannich bases are clinically important for example, biperiden cocaine, ethacrynic acid, atropine, ranitidine, trihexyphenidyl, fluoxetine procyclidine, etc. [4-6]. The Mannich bases are reactive compound and can be converted in to the other compound easily for example active amino alcohols physiologically [7].

The Mannich bases also possesses the number of potent activities such as anti-HIV [8], antimalarial [9], antifungal [10, 11], anticonvulsant [12], antiviral [13], antifilarial [14], anticancer [15, 16], anthelmintic [17], antibacterial [18, 19], antipsychotic [20], antitubercular [21, 22], analgesic [23], anti-inflammatory [24, 25], along with the biological activity the Mannich bases are found to their extensive use in the detergent synthesis and commonly used as a additive in it. Such as the polymers surface active reagents [26]. The Mannich bases and the derivatives of these bases are extensively used as the intermediates for the synthesis of the biologically active compounds [27, 28]. Also the extensive use of this reaction is to prepare or synthesized the compound containing Nitrogens [29].



Content from this work may be used under the terms of the Creative Commons Attribution 3.0 licence. Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.
Published under licence by IOP Publishing Ltd

ISSN 2277 - 5730
AN INTERNATIONAL MULTIDISCIPLINARY
QUARTERLY RESEARCH JOURNAL

AJANTA

Volume - IX

Issue - IV

OCTOBER - DECEMBER - 2020

MARATHI PART - I / II

Peer Reviewed Refereed
and UGC Listed Journal

Journal No. 40776



ज्ञान-विज्ञान विमुक्तये

IMPACT FACTOR / INDEXING

2019 - 6.399

www.sjifactor.com

❖ EDITOR ❖

Asst. Prof. Vinay Shankarrao Hatole

M.Sc (Maths), M.B.A. (Mktg.), M.B.A. (H.R.),
M.Drama (Acting), M.Drama (Prod. & Dir.), M.Ed.

❖ PUBLISHED BY ❖



Ajanta Prakashan

Aurangabad. (M.S.)

❧ CONTENTS OF MARATHI PART - II ❧

अ.क्र.	लेख आणि लेखकाचे नाव	पृष्ठ क्र.
१२	जीवनवास्तवाचा शोध घेणारी प्रदीप पाटील यांची कविता डॉ. कमलाकर चव्हाण	५४-६१
१३	ग्रामीण भारताच्या समस्या डॉ. मधुकर चाटसे	६२-६३
१४	ग्रंथालय संगणकीकरण: एक अभ्यास डॉ. अनिल महादु चौधरी	६४-६९
१५	आपत्ती व्यवस्थापनात प्रशासनाची भूमिका : विशेष संदर्भ कोरोना डॉ. ज्योती घायगुडे	७०-७३
१६	युवकांपुढील सामाजिक व राजकीय आव्हाने प्रा. डॉ. दुष्याने प्रल्हाद दत्तात्रय	७४-८२
१७	आदिवासींचे मानवाधिकार - एक समाजशास्त्रीय अध्ययन प्रा. डॉ. सुनिल प्रल्हाद रायगोळ	८३-८९
१८	भारताच्या लोकसंख्येतील रचनात्मक बदलाचा तुलनात्मक अभ्यास डॉ. सय्यद सादिक बशीर	९०-९४
१९	महाराष्ट्रातील वारकरी संप्रदाय श्री. श्रीकांत दत्तात्रय तनपुरे	९५-९७
२०	प्रादेशिक असमतोल - संकल्पनात्मक अध्ययन डॉ. वैशाली धनराज पाटील कानवडे वैशाली दिनकर	९८-१०३

२०. प्रादेशिक असमतोल - संकल्पनात्मक अध्ययन

डॉ. वैशाली धनराज पाटील

मार्गदर्शक, अर्थशास्त्र विभाग प्रमुख, रयत शिक्षण संस्थेचे, राधाबाई काळे महाविद्यालय, अहमदनगर.

कानवडे वैशाली दिनकर

संशोधक विद्यार्थिनी, पुणे जिल्हा शिक्षण मंडळाचे, बाबुरावजी धोलप कला, विज्ञान, वाणिज्य महाविद्यालय, सांगवी, पुणे.

शोषनिबन्धातील मुलभूत शब्द — प्रादेशिक असमतोल, आर्थिक विकास, मागासलेपणा, प्रादेशिक संतुलन.

शोषनिबन्धाचा गोषवार

जगातील विकसित आणि विकसनशील देशांत विविध भागांना किंवा प्रदेशांचा विकास एकसमान झालेला नाही. सर्वच विकसित, विकसनशील, अल्प विकसित देशांमध्ये आर्थिक, सामाजिक विषमता आढळून येते. म्हणूनच संतुलित प्रादेशिक विकास झाला पाहिजे असा दृष्टीकोन सर्वमान्य होत आहे. भारतासारख्या मोठ्या देशात प्रादेशिक विकासात विषमता किंवा असमतोल असणे स्वाभाविक आहे. प्रत्येक प्रदेशाची ऐतिहासिक पार्श्वभूमी, नैसर्गिक साधनसंपत्ती व वातावरण भिन्न आहे तसेच आर्थिक विकासासाठी उपलब्ध असलेल्या संधीचा लाभ घेण्याकरिता लोकांची मनोवृत्ती सर्वत्र सारखी नाही. प्रादेशिक असमतोल निर्माण होण्यामध्ये राजकीय इच्छाशक्ती, बाह्यक व दळणवळणाची साधने, पाणी, शिक्षण आणि धोरणे राबविणारी यंत्रणा यामध्ये अनेक कमतरता दिसून आल्या.

प्रस्तावना

प्रादेशिक विकास ही एक अभूतपूर्व घटना आहे; परंतु विकसनशील देशात प्रादेशिक असमतोल या समस्येने गंभीर रूप धारण केले आहे. प्रादेशिक असमानता ही विकसनशील देश आणि विकसित देश यांच्यामध्ये पूर्वीपासून अनुभवास येत आहे. १९ व्या शतकाच्या पूर्वार्धात अमेरिका, कॅनडा, इंग्लंड, फ्रान्स, नेदरलँड आणि स्वीडन यांसारख्या काही देशांतील प्रादेशिक असमानतेने अतिशय गंभीर रूप धारण केले होते. आता सर्वच देशांतील (मग ते विकसित किंवा विकसनशील असतील) विकासामध्ये प्रादेशिक असमानतेने अतिशय भयानक रूप धारण केले आहे; परंतु या समस्यांची तीव्रता आणि गांभीर्य हे अधिक तीव्रतेने विकसनशील देशांत अनुभवास येते.

मागास विभागाचा विकास आणि प्रादेशिक असमतोल कमी करण्याचे उद्दिष्ट राष्ट्रीय नियोजनात अगदी पहिल्या योजनेपासून सातव्या योजनेपर्यंत सातत्याने कायम राहिले आहे. तिसऱ्या पंचवार्षिक योजनेत या विषयावर एक स्वतंत्र असे नवीन प्रकरण आहे. त्याच योजनांच्या कामात राज्याच्या पंचवार्षिक योजनांना खरा प्रादेशिक आकारही आला. प्रादेशिक विकासातील समतोल अंततः संवधित अशा अनेक विकसनशील प्रयत्नांनी साध्य होत असतो आणि म्हणूनच ती एक दीर्घकालीन प्रक्रिया आहे असे तिसऱ्या योजनेत म्हटले आहे.

Peer Reviewed Journal for M.Phil., Ph.D. & Appointment of Teacher in Universities & College
ISSN : 2454-4655

VOLUME - 6 No. : 11 Dec. - 2020

International Journal of Social Science & Management Studies

Referred & Review Journal

Indexing & Impact Factor 5.2



International Journal of
Social Science & Management Studies

17

CONTENTS

S. No.	Paper Title	Author Name	Page No.
1	21 वीं सदी के कथा साहित्य में मूल्य परिवर्तन	डॉ. बलवंत बी.एस.	1-2
2	सांस्कृतिक प्रदूषण - 'दोड़' के विशेष संदर्भ में	Dr. Shobhana Kokkadan Dr. B. Anirudhan	3-6
3	ज्योति जैन के कहानी संग्रह में जीवन मूल्य	इरफान बाळासो नायकवडे	7-10
4	मूल्यों को तलाशती हुई - सिमरन	डॉ. एम. जे शिवदास	11-13
5	विभूति नारायण राय कृत 'घर' उपन्यास में बदलते मानवीय मूल्य	प्रा. डॉ. नवनाथ शिंदे	14-18
6	इक्कीसवीं सदी के उपन्यास साहित्य में मूल्य परिवर्तन ('ईधन' उपन्यास के विशेष संदर्भ में)	डॉ. प्रवीण कुमार न. चौगुले	19-22
7	सुरंग में सुबह' उपन्यास में मूल्य परिवर्तन	प्रा. डॉ. संदिप कदम	23-26
8	21वीं सदी के हिंदी कहानी साहित्य में मूल्य परिवर्तन	प्रा. नितिन हिंदूराव कुंभार	27-29
9	21 वीं महिला आत्मकथाओं में व्यक्ति में मूल्य परिवर्तन	प्रा. प्रकाश आठवले प्रा. विकास पाटील	30-36
10	21 वीं सदी के हिन्दी कहानी साहित्य में मूल्य परिवर्तन - व्यापक प्रमर्श की दृष्टि से	प्रनसी पी ए प्रो. (डॉ.) शोभना कोव्काइन	37-40
11	गाथा कुरुक्षेत्र की काव्य में मूल्य परिवर्तन	प्रा. माधुरी परशुराम कांबले	41-46
12	इक्कीसवीं सदी के हिन्दी उपन्यासों में स्त्री-पुरुष संबंध	षमीना. टी प्रो. (डॉ.) शोभना कोव्काइन	47-50
13	'गंदी बात' उपन्यास में सामाजिक मूल्य परिवर्तन	श्री. संतोष शंकर साळुंखे	51-57
14	21वीं सदी के हिंदी उपन्यासों में मूल्य योजना	साधन मदन जाधव	58-61
15	हिंदी कथा साहित्य में मूल्य परिवर्तन 'बिजूका' कथा संग्रह के संदर्भ में	डॉ. दिलीपकुमार कसबे	62-68
16	कृष्णा सोबती का उपन्यास 'समय-सरगम' में मूल्य परिवर्तन	सुवर्णा नरसु कांबळे	69-74

21वीं सदी के हिंदी कहानी साहित्य में मूल्य परिवर्तन

प्रा. नितिन हिंदूराव कुंभार

आर्ट्स सायन्स अँड कॉमर्स, कॉलेज, रामानंदनगरबुर्ली, तह-पलूस, जिला सांगली

21वीं सदी में सामाजिक और सांस्कृतिक मूल्यों में क्रांतिकारी परिवर्तन हुए हैं। एक ओर पाश्चात्य दर्शन, सभ्यता, संस्कृति, नयी शिक्षा प्रणाली, वैज्ञानिक आविष्कार आदि के कारण नवीन मूल्यों की सृष्टि हुई तो दूसरी ओर परंपरागत मूल्यों का पतन हुआ। इसी द्वंद ने सामाजिक आदर्शों को विघटित करने में महत्वपूर्ण भूमिका निभाई। अतः मनुष्य की भौतिक उन्नति जितनी गति के साथ परिवर्तित हो गयी उतनी ही गति के साथ उसका सामाजिक और नैतिक अधःपतन हो गया। इस संबंध में पूरनचंद्र जोशी का कथन है कि, "मनुष्य जितना भौतिक दृष्टि से पिछड़ा हुआ है उतना ही वह नैतिक दृष्टि से शुद्ध, पवित्र और सज्जन है और जैसे-दृष्टि से मनुष्य भौतिक दृष्टि से उन्नत या समृद्ध होता जाता है उतना ही नैतिक दृष्टि से उसका पतन हो जाता है।" इस प्रकार वर्तमान युग की सामाजिक और नैतिक व्यवस्था के कारण हमारी संपूर्ण जीवन पद्धति ही बदल गयी है। सामाजिक मूल्यों के विघटन के कारण मानवता का नाश हो गया है। केवल एक ही जीवन का मूल्य बन गया है किसी भी तरह से, सही या गलत मार्गों से धन - संपत्ति प्राप्ति करना। इस दृष्टि से सुशीलकुमार सिंह का कथन बहुत ही समीचीन है, "जहाँ शिक्षा का उद्देश्य नौकरी पाना हो, राजनीति का लक्ष्य पैसों और गुंडई के बल पर सर्वोच्च स्थान पाना हो और एक आम आदमी के लिए पैसों कमाना ही (चाहे जैसे और जिस ढंग से हो) उद्देश्य रह गया हो उस समाज में नैतिकता के मूल्य को ढूँढ़ना मुश्किल ही होगी।" अतः सामाजिक और नैतिक विघटन का महत् कारण 'अर्थ' ही है।

21वीं सदी मूल्य संक्रमण की सदी मानी जाती है। वैश्वीकरण के बढ़ते प्रभाव के कारण परंपरागत भारतीय मूल्य पतन की कगार पर खड़े हैं, तो पाश्चात्य सांस्कृतिक जीवन मूल्य अपना अधिपत्य जमाने का सफल प्रयास कर रहे हैं। मूल्य संक्रमण का सबसे ज्यादा प्रभाव नयी पीढ़ी पर हो रहा है। अतः उन्हें पुराने मूल्य, विश्वास और आस्थाएँ व्यर्थ और खोखली प्रतीत हो रही हैं।

इसलिए नये जीवन मूल्यों के प्रति उनकी ललक बढ़ गयी है। मनुष्य जीवन का अभिन्न अंग बनते जा रहे नये जीवन मूल्यों पर 21वीं सदी के कहानीकारों ने कसकर प्रहार किए हैं।

आज हमारी रोजमर्रा की जिंदगी में हररोज नयी-नयी संस्कृतियाँ आ रही हैं। जो हमारे जीवन का हिस्सा बनती चली जा रही है। फ्लैट संस्कृति भी इनमें से एक है। एक ही इमारत में अनेक लोग- परिवार अजनबी की तरह रहते हैं। उनमें आत्मीयता का अभाव होता है। बाहर से सुंदर दिखाई देनेवाली इमारतें अंदर से अपनेपन को खोई हुई हैं। अकेलेपन से त्रस्त हैं। इसके बजाय चाल में रहनेवाले लोगों में एक - दूसरे के प्रति आत्मीयता कुट - कुटकर भरी होती है। सुधीर ओखदे 'अपार्टमेंट संस्कृति' में इस नयी सभ्यता पर करारी चोट करते हुए कहते हैं, "एक मित्र ने मुझे बताया कि अपार्टमेंट एक वेश्या की तरह होता है जो बाहर से जितना खूबसूरत दिखता है अंदर उतनी ही बीमारियाँ समेटे रहता है। वेश्या की तरह उसके मालिक तो खूब होते हैं पर उसकी देखभाल करनेवाला कोई नहीं होता। अतः अपार्टमेंट को बाहर से नहीं अंदर से घुसकर देखो वहाँ तुम्हें सर्वत्र गंदगी का साम्राज्य मिलेगा। लोग ग्राहकों की तरह व्यवहार करेंगे। अतः तुम चाल में ही उत्तम हो। सपने देखना बंद करो और खबरदार रहो।... लोग सामने दिख जाएँ तो सूनी आँखों से एक - दूसरे को तौलते हुए। एकदूसरे के नमस्कार की प्रतीक्षा में बिना किसी अभिवादन के अजनबी - सी जिंदगी जीते ये मुझे सीमेंट और गोरे पत्थर के बने लगने लगे हैं।" अतः भीड़ में भी अजनबीपन का अहसास दिखनेवाली आज की अपार्टमेंट संस्कृति पर किया गया यह व्यंग्य बिल्कुल यथार्थवादी है।

समाज में आज परंपरागत सिद्धांतों, विचारों और आदर्शों को अपनाकर चलनेवालों को दकियानूसी, असभ्य तथा अनाधुनिक माना जाता है। किसी - न - किसी बहाने उससे दूरी बनाए रखते हुए बहिष्कृत - सा व्यवहार किया जाता है



Unravelling the regulatory role of miRNAs in secondary metabolite production in medicinal crops

Shreya Chakraborty^a, Prasann Kumar^b, Rupa Sanyal^c, Abhijit Bhagwan Mane^d,
D. Arvind Prasanth^e, Manoj Tukaram Patil^f, Abhijit Dey^{a,*}

^a Department of Life Sciences, Presidency University, 86/1 College Street, Kolkata 700073, West Bengal, India

^b Department of Agronomy, School of Agriculture, Climate Mitigation and Sustainable Agricultural Laboratory, Divisions of Research and Development, Lovely Professional University, Jalandhar, Punjab, India

^c Department of Botany, Bhairab Ganguly College, Kolkata, West Bengal, India

^d Department of Zoology, Dr. Pannu Kadam Mahavidyalaya, Ramnandnagar (Burd), Tel: Pehus, Dist: Sangli, Maharashtra, India

^e Department of Microbiology, School of Biosciences, Periyar University, Salem, Tamilnadu, India

^f Post Graduate Department of Botany, SNJB's KKA Arts/SMGL Commerce and SPHU Science College, Chandwad (Nashik), Maharashtra, India

ARTICLE INFO

Keywords:
miRNAs
Secondary metabolites
Medicinal plants
Metabolic engineering
Flavonoids
Terpenoids
Alkaloids

ABSTRACT

Plant secondary metabolites (PSMs) such as flavonoids, terpenoids, alkaloids etc. have many biological, ecological and pharmaceutical significance. Owing to their immense importance, elucidation of their regulatory mechanisms is pivotal. Micro-RNAs (miRNAs), the small, endogenous, noncoding RNA molecules of about 21 nucleotides, capable of regulating gene expression in eukaryotes, are off late gaining attention as potent engineer in regulating plant secondary metabolite synthesis. They have been used in metabolic engineering as they can target mRNAs for cleavage and translational repression thereby regulating key biological processes. However, knowledge on their role in plant secondary metabolite biosynthesis is still in its infancy. The present review comprehensively encompasses the regulatory role of miRNAs in the biosynthetic pathways of major plant secondary metabolites such as alkaloids, terpenoids and flavonoids with notes on their target genes and their biosynthetic products, kinds of regulatory miRNAs with their respective regulatory roles and methods of detection with a note on the future direction of relevant research.

1. Introduction

Plants have been a prime source of food and medicine since time immemorial (Dey et al., 2020). Plants are considered as the storehouse of valuable metabolites owing to their immense benefit and use as food, medicine, nutraceuticals and pharmaceuticals (Modak et al., 2020). Plant metabolites are broadly characterized into primary and secondary types of which primary metabolites are mostly implicated to the growth and development of the plant. On the contrary, secondary metabolites, although not essential for the plant, are the defense molecules, primarily engaged in combating biotic and abiotic stresses in plants (Patra et al., 2013). An array of diverse plants secondary metabolites viz. alkaloids, flavonoids, tannins, phenolics, terpenoids, saponins, glycosides have been utilized by human for their immense pharmacological potential and health benefits (Debnath et al., 2016).

Off late, plant biotechnology, metabolic engineering and synthetic biology toolkits have been employed successfully to regulate and opti-

mize the production of valuable plant secondary metabolites for human use (Guerriero et al., 2018). Recently, miRNAs have been reported to play crucial roles in modulating many regulatory mechanisms in plants (Samad et al., 2017) including the production of secondary metabolites (Qiao et al., 2017). Additionally, they are flexible enough to be positively and negatively regulated, thus providing scope for increasing production of desired metabolites and limiting production of negative metabolites (Sabzelmann and Neghavi, 2019). Until now, no review on the current topic was noted except one by Gupta et al., 2017, who compiled the reports on the identification and characterization of miRNA in the production of plant secondary metabolites. Since 2017, many works have been performed in the relevant fields and here we have tried to encompass the recent literature mostly keeping in mind the contribution of the older reports with notes on future perspectives.

miRNAs are small (21–23) nucleotide long, non-coding, single stranded ribo-regulators that has the ability to regulate the eukaryotic gene expression post transcriptionally by binding to mRNA (Treiber et

* Corresponding author.

E-mail address: abhijit.d@presidency.ac.in (A. Dey).

<https://doi.org/10.1016/j.plantgene.2021.100303>

Received 15 November 2020; Received in revised form 1 May 2021; Accepted 13 May 2021

2352-4073/© 2021