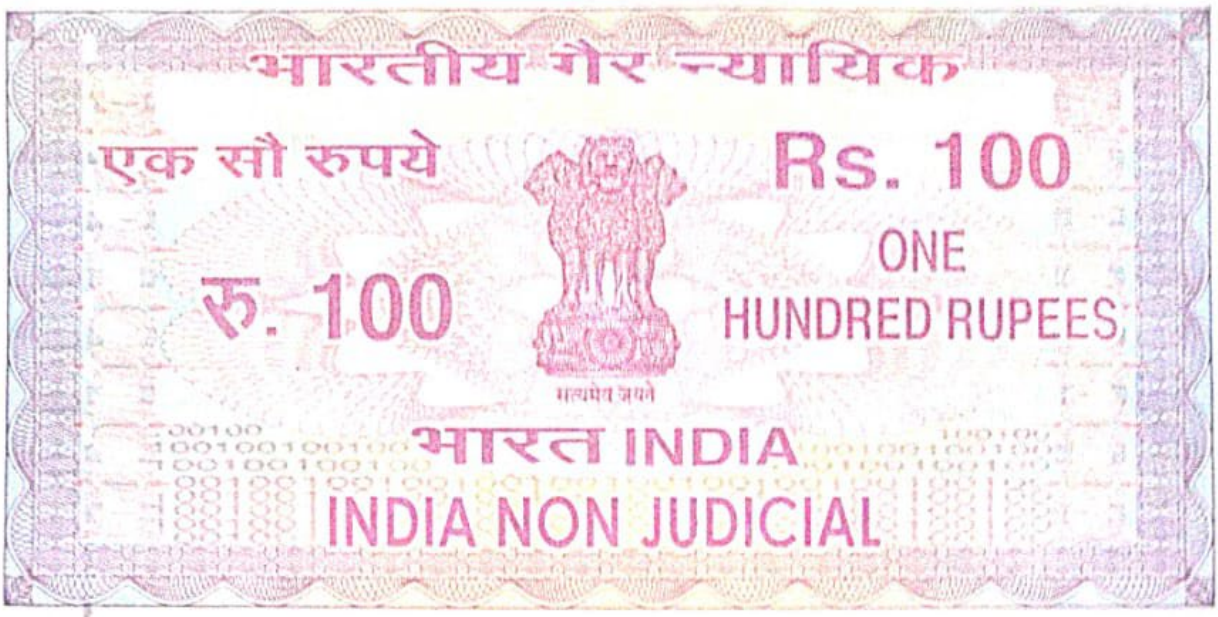

महाराष्ट्र MAHARASHTRA ◑ 2017 ◑ RZ 132376

20 JUN 2017

उपकोषागार अधिकारी, शिरपूर, जि. धुळे.

MEMORANDUM OF UNDERSTANDING BETWEEN

RCPET's R. C. Patel Arts, Commerce and Science College, Shirpur - 425405

AND

Khandesh Shikshan Mandal Sanchalit Pratap College (Autonomous), Amalner

FOR THE DEVELOPMENT OF ACADEMIC AND RESEARCH COOPERATION

The present MoU is signed on **03rd July 2019** between **R. C. Patel Arts, Commerce and Science College Shirpur - 425405**, run by **R. C. Patel Educational Trust's Shirpur** and **Pratap College (Autonomous), Amalner – 425401,** run by **Khandesh Shikshan Mandal Sanchlit Amalner.**

The MoU has following objectives:

1) To encourage faculty members from both institutes to collaborate research activities.
2) To share the institute's lab and research resources.
3) To assist in faculty and post graduate students training.
4) To carry out multidisciplinary research projects for postgraduate students of both institutes.

Duration of the MoU:

The agreement will be in effect for FIVE years, with the possibility of a FIVE year extension after evaluation.

Coordinators:

A person in charge of the MoU who will assume responsibility for the agreement will be appointed by both the institutes.

IPR benefits:

IPR gains from the collaborative research projects will be shared between the two institutes.

For,

KSM's Pratap College (Autonomous),
Amalner – 425401

RCPET's R. C. Patel Arts, Commerce & Science College, Shirpur - 425405

SEAL

KSM's Pratap College (Autonomous),
Amalner – 425401

Pratap College, Amalner

RCPET's R. C. Patel Arts, Commerce and Science College, Shirpur – 425405

PRINCIPAL
R.C.Patel Educational Trust's
R.C.Patel Art's,Com.&Sci.Colle
Shirpur,Dist-Dhule(M.S.)

SEAL

Witness Name: 1. Dr. A. M. Patil Signature:

2. A C Bhavsar Signature:

R. C. Patel Educational Trust's
R. C. Patel Arts, Commerce and Science College
Karvand Naka, Shirpur 425405, Dist - Dhule, Maharashtra
☎: (02563) 299328
E-mail: principal@rcpasc.ac.in

President
Hon. Bhupeshbhai Patel

Principal
Dr. D. R. Patil

Name of Institute/Industry :- Khandesh Mandal Sanchlit Pratap College (Autonomous), Amalner

Year of Signing Linkage/ MoU :- 2019

Duration of Linkage/MoU :- 05 Years

List of Activities carried out under MoU with Khandesh Mandal Sanchlit Pratap College (Autonomous), Amalner

Authorized signatures:

KSM's Pratap College (Autonomous),
Amalner 425401
Pratap College, Amalner
P.C.A.

SEAL
R.C.Patel's R. C. Patel Arts, Commerce and Science College • Shirpur •

PRINCIPAL
R. C. Patel Educational Trust's
R. C. Patel Arts, Commerce and Science College
Shirpur, Dist.-Dhule (M.S.) 425405

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ONE DAY NATIONAL CONFERENCE ON RECENT ADVANCES IN SCIENCES
Held on: **13th February 2020.**
Organized by: **Department of PHYSICS, CHEMISTRY, MATHEMATICS, BOTANY & ZOOLOGY Shivaji Arts, Commerce and Science College** Kannad. Dist: Aurangabad

Photoconductivity Studies of $Zn_xCd_{1-x}S$ ($0 \leq x \leq 1$) Thick Film Prepared by Screen Printing Technique

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[c]*Department of Chemistry, R. C. Patel Institute of Technology, Shirpur-425405, India.*

[d]*Department of Physics, R. C. Patel Institute of Technology, Shirpur-425405, India.*

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Abstract

$Zn_xCd_{1-x}S$ ($0 \leq x \leq 1$) thick films were prepared by Screen printing technique and their photoconducting behaviour was studied. The relationship of dark current with d. c. applied voltage was determined. The variation of photocurrent of each of the $Zn_xCd_{1-x}S$ ($0 \leq x \leq 1$) thick films with applied d. c. voltage at a fixed photoexcitation was recorded. Effect of wt % of Cd on photosensitivity was studied. The studies shows that photocurrent and dark current go on increasing with the increase of wt % of Cd. Photosensitivity goes on increasing with the increase of wt % of Cd in the composition.

Keywords: $Zn_xCd_{1-x}S$ ($0 \leq x \leq 1$), Screen printing, Photocurrent, Dark current, Photosensitivity.

1. Introduction

II-VI Compounds have a prominent place in modern semiconductor physics and technology, as they show a high efficiency of radiative recombination, high absorption coefficients and direct band gaps corresponding to a wide spectrum of wavelengths from UV to IR region [1]. Many of these systems form a continuous range of solid solutions. In the wurtzite (hexagonal) structure, CdS and ZnS have unit cell volumes ~1.26:1 and cation radii in the ratio Cd++/Zn++ ~1.3. Their band gaps differ by ~1.3 eV (2.4 eV for CdS, ~3.7 eV for ZnS) and their extrinsic conductivities are normally many decades apart. However many similarities exist between them. Both of the II-VI family exhibiting properties intermediate between the covalent group IV elements with III-V compounds on the one hand and the ionic I-VII compounds on the other. A considerable number of qualitative similarities are seen in their photoelectronic properties: for example, they are both n-type photoconductors, they both exhibit analogous edge emission and fluorescence (although these are quite different quantitatively). Recent work by Rothwarf et al. [2] indicated that improvements in the photovoltaic output of CuxS/CdS thin film solar cells could be achieved by incorporating a small fraction Zn to CdS. It has been reported by Singh et al. [3] that indeed the open-circuit voltage rose proportionally with the amount of Zn added up to about 70% in CdS. Chow et al. [4] also demonstrated improvements in spectral response measurements in the chemically sprayed Zn-added $Cu_xS/Cd_yZn_{1-y}S$ cells. The preliminary results seemed to indicate that the addition of Zn improves the photovoltaic response although at the same it raises the cell

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XRD STUDIES OF CdS SOLID SOLUTION

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[1]*R. C. Patel Arts, Commerce & Science College, Shirpur*
[2]*Pratap College, Amalner*
Corresponding Author: ampatil67@gmail.com

***Abstract*- Solid Solution of CdS was prepared by Flux technique. d values, lattice parameters 'a', 'c' and unit cell volume, grain size were determined by XRD. The studies show that hexagonal structure for CdS.**

***Keywords*-CdS, Solid Solution, Flux technique, XRD, lattice parameters.**

1. INTRODUCTION

Cadrniurn sulphide has widespread applications in the field of electronics ranging from phosphors to photovoltaic cells. CdS have in recent years aroused keen interest since their structural, optical and electronic properties can be suitably tailored for optimum device performance. CdS films are of considerable interest in heterojunction solar cells and photovoltaic applications (1, 2).

Flux method is a simple technique to synthesize high quality homogeneous solid solutions with the potentials of up-scaling. Flux technique permits the synthesis of solid solutions well below the melting point of the material (3-7). Na_2S_x solvents are reported as suitable fluxes to synthesize metallic sulphides. The advantages of Na_2S_x solvents are the presence of common anion and the insignificant incorporation of sodium into the material to be synthesized. The liquidus temperature of Na_2S (978°C) decreases to the eutectic with Na_2S_4 at 65 wt. % S and 230°C. Melting points and eutectics of Na_2S_4, Na_2S_5 and Na_2S_6 lie between 230°C and 300°C. Sodium polysulphides are soluble in cold water and can be easily separated from the final product. Equipments required is simple and within the financial scope of most laboratories. There are few reports on the synthesis of CdS solid solutions by flux method. Efforts have therefore been made to synthesize CdS solid solutions for functional applications.

2. MATERIALS AND METHODS

2.1. PREPARATION OF CdS SOLID SOLUTIONS BY FLUX METHOD

The hydrated sodium sulphide ($Na_2S.9H_2O$), high purity sulphur and an appropriate wt. % of coarse cadmium powder were used as starting materials. The preparation procedure of CdS is explained as follows.

2.2. PREPARATION OF CdS

The 1 weight % of Cd, were mixed thoroughly into an appropriate amount of sulphur and $Na_2S.9H_20$. The mixture was transferred into platinum crucible. The crucible was placed in kanthol wound muffle furnace. Space around and above the crucible was filled with coarse corundum powder. The furnace temperature was increased to 600°C. This temperature was then maintained for an hour. The furnace was then cooled to room temperature. Excess sulphur evaporated and removed the residual oxygen and water as $S0_2$ and H_2S, respectively. The product in the crucible was washed with double distilled water. Sodium polysulphides got dissolved in water and separated out easily. The final product was dried.

2. STRUCTURAL ANALYSIS OF THE CdS

X-ray diffraction patterns of the CdS were recorded with the Phillips X-ray diffractometer Model PW-1730 using CuKα radiations with Ni filter (A 1.5418 A). The lattice constants were determined.

3. RESULTS AND DISCUSSION

3.1. STRUCTURAL INVESTIGATION OF CdS

X-ray diffraction analyses of CdS solid solution were carried out with a view to gain information about the aspect interplanar spacing, lattice parameters a, c and volume of a unit cell, identification of crystal structure, to determine the particle size of material under investigation.

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IMMOBILIZATION OF LACCASES: AN OVERVIEW OF ITS METHODS AND APPLICATIONS FOR A SUSTAINABLE ENVIRONMENT

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Tejas B. Chaudhari, Dept. of Microbiology and Biotechnology, R. C. Patel Arts, Commerce and Science College, Shirpur, Maharashtra, India

Sandip P. Patil Head and Associate Professor. Dept. of Microbiology and Biotechnology, R. C. Patel Arts, Commerce and Science College, Shirpur, Maharashtra, India

Abstract: Laccase is a copper-containing oxidase with huge versatility due to its broad range of substrate specificity. The enzyme is widely used in the paper and pulp industry, bioremediation, bioleaching of synthetic dyes, food processing and pharmaceutical industries, etc. However, industrial applications of laccases are hampered by changes in pH, temperature, and activity loss, leading to higher costs. In addition, free laccases show poor stability at various physiological conditions. Hence, immobilization of laccase is a well-run strategy to improve their kinetic properties, reduce enzyme loss, and subsequently reduce costs of the products. Moreover, it improves the storage and operational stabilities as well as reusability and this represents a great advantage compared with the free laccases. Laccases are immobilized by adsorption, entrapment, covalent attachment, and cross-linking. This review aims to study different aspects of laccase immobilization methods, carriers, and their applications towards sustainable environment.

Keywords: Laccase; Immobilization; Adsorption; Bioremediation.

Introduction: Laccases, also known as benzenediol: oxygen oxidoreductases (EC 1.10.3.2), are one of the most ubiquitous multicopper oxidase groups since, these enzymes can oxidize phenolic substances. More recently, there has been a lot of research done on these enzymes' applicability in many industrial sectors. The massive production of the enzyme is required to meet the tremendous demand for laccase in many applications. The primary obstacle to the commercial use of laccases is the high cost of manufacture. Laccases are produced by a diverse range of plants, fungi, and bacteria, making them ubiquitous in nature.

They performed varied roles depending on the organism. In bacteria and fungus, laccase is a glycosylated monomer or homodimer protein that typically contains 10-25% fewer saccharide molecules than plant enzymes. In recent decades, there has been a notable surge in the production of consumer goods as a result of the rapid expansion in the economy. No doubt, industrial development is vital for economic progress and is always coupled with a cost paid in terms of environmental pollution [1-3]. The number of manmade activities makes the environment polluted. Food-related plastic packaging materials, paper, agrochemicals, textiles industries wastewater discharge contain harmful chemicals, which are unstable, and carcinogenic.

The environment's health is greatly endangered by the discharge of these chemicals into the soil and water. Each of these types of pollutants has a major effect on the ecosystem either directly or indirectly. They may also accumulate in various food sources and eventually have a detrimental impact on human health over time. Enzymes can play a crucial role in making a sustainable environment. For this purpose, various enzymes were utilized, including laccases, peroxidases, and oxygenases. As compared to other enzymes, laccase use has drawn favorable attention because water is the only byproduct and no additional, costly co-substrate or co-factor is needed other than oxygen. In order to increase the reuse and stability of enzymes in different harsh conditions, immobilization is one of the most convenient approaches. Furthermore, because of its low stability, limited reusability, and high cost, free laccase has no known industrial use [4]. So the review aims to increase the scope of applications for immobilized laccase to make a sustainable environment.

खान्देश शिक्षण मंडळ संचलित
प्रताप महाविद्यालय, अमळनेर
(स्वायत्त)
क.ब.चौ. उत्तर महाराष्ट्र विद्यापीठ, जळगांव संलग्नित
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Ref. No. 467/2024-22

Date : 01/10/2024

प्रति,
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आर.सी.पटेल कॉलेज,
शिरपूर, जि.धुळे

महोदय,

आपणास कळविण्यात येते की, **मंगळवार, दि.5 ऑक्टोबर 2021 रोजी दुपारी 2.00 वाजता** आपल्या महाविद्यालयात तासिका तत्त्वावरील (CHB) उमेदवारांच्या मुलाखती आयोजित करण्यात आलेल्या आहेत.

आपली **फिजिक्स** या विषयाचे **विषयतज्ञ** म्हणून नेमणूक करण्यात आलेली असून आपण मुलाखती घेणेकरिता व भोजनास उपस्थित राहावे ही विनंती.

कळावे,

PRATAP COLLEGE P.C.A. AMALNER

प्रभारी प्राचार्य,
प्रताप महाविद्यालय, अमळनेर.

खान्देश शिक्षण मंडळ संचलित
प्रताप महाविद्यालय, अमळनेर
(स्वायत्त)
क.ब.चौ. उत्तर महाराष्ट्र विद्यापीठ, जळगांव संलग्नित
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Ref. No. 505/ 2022-23

Date : 30-09-22

प्रति,

प्रा.डॉ.ए.एम.पाटील,

आर.सी.पटेल महाविद्यालय,

शिरपुर

महोदय,

आपणास कळविण्यात येते की, **शनिवार, दि.1 ऑक्टोबर 2022 रोजी सकाळी 10.00 वाजता** प्रताप महाविद्यालयात तासिका तत्त्वावरील (CHB) उमेदवारांच्या मुलाखती आयोजित करण्यात आलेल्या आहेत.

आपली **पदार्थविज्ञान** या विषयाचे **विषयतज्ञ** म्हणून नेमणूक करण्यात आलेली असून आपण मुलाखती घेणेकरिता उपस्थित राहावे ही विनंती.

कळावे,

प्रभारी प्राचार्य,
प्रताप महाविद्यालय, अमळनेर.

1990
'A' Grade
NAAC Re-accredited
(3rd Cycle)

KAVAYITRI BAHINABAI CHAUDHARI NORTH MAHARASHTRA UNIVERSITY, JALGAON

KBCNMU/11/Ph.D./Conf.Letter/Online/ **Micro.** /2021 Date : 11-10-2021

To,

Mrs. VAISHALI LAXMAN MAHAJAN

Subject:- Admission to Ph.D. Course in the Subject of Microbiology under the faculty of Science and Technology

Sir/Madam,

With reference to the above subject, this is to inform you that, you were provisionally registered for Ph.D. course in the subject to Microbiology under the faculty of Science and Technology. Now, after successful presentation of your research outline before RRC meeting and completing of Pre-Ph.D. Course work, the University authorities have confirmed your admission to Ph.D. course in the above subject and faculty. The particulars of your admission are as below :-

Registration Details		
a)	Name of Guide	Dr. Patil Sandip Prakash
b)	Name of Co-guide (if any)	--
c)	Place of Research Work	DEPARTMENT OF MICROBIOLOGY R C PATEL ARTS COMMERCE AND SCIENCE COLLEGE SHIRPUR
d)	Date of Registration	02-11-2020
e)	Date of Approval of Research Title (RRC)	28-08-2021
f)	Application No.	PHD-2019-VQB8LO
g)	Topic of Research	Microbial Laccase Production and its Biotechnological Applications

Paper	Paper I (Research Methodology & Research and Publication Ethics)	Paper - II (Subject Specific Course)	Paper - III (Guide Course)
Grade	A	A	O

Note: -

1. **Rules and regulations regarding Ph.D. are as per UGC regulation, 2009 (Minimum Standards and Procedure for Awards of M.Phil/Ph.D. degree) and Ph.D. Guideline-2017 of Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon ammended from time to time and fees will be applicable as stated in provisional registration letter.**
2. You are requested to apply for eligibility certificate to the Research section of this university within Six Months from the date of issue of this letter. The eligibility fee is Rs. 500/- and late fee of Rs. 1000/- will be charged if the candidate fails to apply for eligibility certificate within Six Months from the date of issue of this letter. To fulfill

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National Conference on Current and Future Prospects in Life Sciences

"CFPLS - 2023"

CERTIFICATE

This is to certify that Mr./Miss/ Dr./Prof. Ayushi D. Pardeshi (First Rank)

of R.C. Patel Arts, Com. Sci., Shirpur has participated as Resource person/ Chaired a session/ Keynote Speaker/ Presented a research Poster / published Paper entitled "Microbial Consortium: A Potential Biotechnological in One Day National Level Conference on "Current and Future Prospects in Life Sciences "CFPLS - 2023" Organized by School of Life Sciences (Department of Botany, Zoology and Microbiology) on 26 October, 2023.

Dr. Anil N. Shinde (Chairman, K.E.S., Amalner)	Mr. Shashikant A. Joshi (Convener)	Dr. Raju C. Sarvade (Convener)	Dr. Mukesh P. Bhole (IQAC Co-ordinator)	Dr. Arun. B. Jain (Principal)

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This is to certify that Mr./Miss/ Dr./Prof. Shubham Vijaykumar Yadav of R.C. Patel Arts, College, Amalner has participated as Resource person/ Chaired a session/ Keynote Speaker/ Presented a research Poster / published Paper entitled "Effective Biocontrol of Banana wilt disease in One Day National Level Conference on "Current and Future Prospects in Life Sciences "CFPLS - 2023" Organized by School of Life Sciences (Department of Botany, Zoology and Microbiology) on 26 October, 2023.

Dr. Anil N. Shinde (Chairman, K.E.S., Amalner)	Mr. Shashikant A. Joshi (Convener)	Dr. Raju C. Sarvade (Convener)	Dr. Mukesh P. Bhole (IQAC Co-ordinator)	Dr. Arun. B. Jain (Principal)

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This is to certify that Mr./Miss/ Dr./Prof. Varsha D. Jayaswal

of R.C.P.A.C.S College, Shirpur has participated as Resource person/ Chaired a session/ Keynote Speaker/ Presented a research Poster / published Paper entitled Microbial Surfactant a promissing tool for biotechnological applications.

in One Day National Level Conference on "Current and Future Prospects in Life Sciences "CFPLS - 2023" Organized by School of Life Sciences (Department of Botany, Zoology and Microbiology) on 26 October, 2023.

Dr. Anil N. Shinde (Chairman, K.E.S., Amalner)	Mr. Shashikant A. Joshi (Convener)	Dr. Raju C. Sarvade (Convener)	Dr. Mukesh P. Bhole (IQAC Co-ordinator)	Dr. Arun. B. Jain (Principal)

Prof. Harsha Pardeshi from R.C. Patel Arts Commerce and Science College received First Rank in Paper Presentation at National Conference on Current and Future Prospects in Life Sciences at Pratap College, Amalner.

First Prize received in National Conference at Pratap College, Amalner