भारतीय गैर न्यायिक

एक सौ रुपये Rs. 100

रु. 100 ONE HUNDRED RUPEES

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भारत INDIA

INDIA NON JUDICIAL

महाराष्ट्र MAHARASHTRA 2020

XF 430356

11 SEP 2020

MEMORANDUM OF UNDERSTANDING BETWEEN
R. C. PATEL ARTS, COMMERCE AND SCIENCE COLLEGE, SHIRPUR
AND

RSS'S Annasaheb Awate Arts, Commerce, Hutatma Babu Genu Science College and Sou. Kusumben Kantilal Shah Arts, Commerce and Science Jr. College, Manchar, Tal: Ambegaon, Dist: Pune.

FOR THE DEVELOPMENT OF ACADEMIC AND RESEARCH COOPERATION

The present MoU is signed on 15/10/2020 between

RCPET'S R. C. Patel Arts, Commerce and Science College, Shirpur

AND

RSS'S Annasaheb Awate Arts, Commerce, Hutatma Babu Genu Science College and Sou. Kusumben Kantilal Shah Arts, Commerce and Science Jr. College, Manchar, Tal: Ambegaon, Dist: Pune.

The MoU has following objectives:

1. To promote the research collaborations among the faculty of both the institutes.
2. To share the research and laboratory facilities of the institute.

Duration of the MoU:

The duration of the MoU will be FIVE years and upon review it can be further extended for TWO years.

Coordinators:

Bothe the institute will appoint a person in charge for the MoU who will take the responsibility of the agreement.

IPR benefits:

IPR benefits of the joint research work will be shared by both the institutes.

Signatures

On behalf of

(Dr. D. R. Patil)

R. C. Patel Arts, Commerce and Science College, Shirpur

R.C. Patel Arts, Com. & Sci. College ★ Shirpur ★

On behalf of

Principal
Annasaheb Awate Arts, Commerce &
Hutatma Babu Genu Science College, Manchar

RSS'S Annasaheb Awate Arts, Commerce, Hutatma Babu Genu Science College and Sou. Kusumben Kantilal Shah Arts, Commerce and Science College, Manchar, Tal: Ambegaon, Dist: Pune.

Annasaheb Awate Arts, Commerce & Hutatma Babu Genu Science College, Manchar ★

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	:-	Annasaheb Awate Arts, Commerce & Hutatma Babu Genu Science College, Manchar
Year of Signing Linkage/ MoU	:-	2020
Duration of Linkage/MoU	:-	05 Years

List of Activities carried out under MoU with Annasaheb Awate Arts, Commerce & Hutatma Babu Genu Science College, Manchar

Authorized signatures:

Dr. K. G. Kanade
Principal

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

PRINCIPAL
R. C. Patel Educational Trust's
Patel Arts, Commerce and Science College

Detail Session Time-table

Day - 1	
Inauguration	11:30 - 12:00
Session - 1	12:00 - 02:00
Session - 2	02:30 - 04:30

Day - 2	
Session - 1	11:30 - 01:50
Session - 2	02:00 - 04:00

Registration

For Registration to the seminar, kindly fill the Google registration form

Link for Registration form :
https://forms.gle/j9m4UqCGSpkENJhW9

No Registration Fee

Address for Correspondence

Dr. Sandip P. Patil
Email: patilsandip3@gmail.com
Mob. No.: 9284478255, 9881392185

Important Dates

Last Date of registration : 17th February 2023
Event Dates : 20 to 21 February 2023
Event Time : 11:00 am - 4:30 pm

Targeted Participants : This interdisciplinary State Level Seminar is arranged for Principals/HoDs/ Teachers and Researchers in higher education.

The seats are limited to 200 candidates. The preference will be on first-come-first-serve basis.

Our Patrons

Hon. Shri. Amrishbhai R. Patel

Hon. Shri. Bhupeshbhai R. Patel

Hon. Shri. Rajgopal C. Bhandari

Hon. Prin. Dr. K. B. Patil

Convener & Chairman

Dr. Dilip R. Patil
Principal

Co-ordinator

Dr. Sandip P. Patil
Head, Biotechnology Department

Organizing Committee

Prof. Dr. A. M. Patil (Vice-Principal)
Dr. A. G. Sonawane
Dr. R. V. Sonar
Dr. R. R. Vasave
Dr. S. S. Chaudhari
Mr. R. C. Bhavsar
Mr. M. G. Vaidya
Mr. J. P. Sonawane
Mr. G. R. Sonar
Mr. D. U. Patel

Dr. R. D. Jadhav (Vice-Principal)
Dr. J. P. Mahashabde
Dr. R. S. Pawar
Mr. B. S. Panchbhai
Dr. S. M. Patil
Mr. D. E. Chavan
Dr. A. B. Jadhav
Dr. M. P. Patil
Mr. S. M. More
Mr. B. T. Chaudhari

R.C.PATEL EDUCATIONAL TRUST

A State Level Seminar on

NEP-2020 Opportunities & Challenges

20 - 21 February 2023

Organized by

R. C. Patel Educational Trust's

R. C. Patel Arts, Commerce & Science College, Shirpur - 425405 (Maharashtra)

(02563) 299328
contact@rcpasc.ac.in

Mode: Offline

Venue

S. M. Patel Memorial Hall, R. C. Patel Arts, Commerce & Science College, Shirpur

About the Institute

The R. C. Patel education trust provides primary, secondary and tertiary education at elementary to advanced level in humanities, management and science including technical and professional courses. The R. C. Patel Arts, Commerce and Science College, Shirpur was established in 1991 by the trust.

R. C. Patel Arts, Commerce and Science College, Shirpur is located in rural tribal area, working with a vision to be pre-eminent institute which bring out the best among the students. The college is Grant-in-aid college sanctioned by Maharashtra state and also runs several self-financing courses. College is permanently affiliated to Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon (Maharashtra) and received 2 (F) and 12 (B) status of University Grant Commission (UGC), New Delhi. College also received Guajarati Minority Status and caters to the higher educational needs of students belonging to rural and semi urban area for last 30 years.

Our Vision

- To be a pre-eminent educational institute where teaching and learning brings out the best in the students.

Our Mission

- To impart the quality education to the students especially to the socially
- economically backward students from the middle class in the vicinity with a view that education will make them economically independent.
- To enable our students to face the unknown situations and to make them strong to face the problems of the rapidly changing and increasingly complex world.
- To make our students responsible, sensitive, socially committed and to develop in them spiritual insight and the ideas of patriotism, democracy, secularism, socialism and peace.

About the Seminar

The present National Education Policy of India 2020 (NEP 2020), aims at school and higher education institutions both outlining the vision of new education system of India. Through NEP 2020, the Government of India has paved the way for transformative and dynamic reform in school and higher education system of our country. The National Education Policy 2020 was approved by the Union Cabinet of India on July 29, 2020. The new education policy has replaced the previous "National Policy on Education, 1986" which was the second only education policy of India since independence as the first "National Policy on Education" was launched in the year 1968. The first education policy of 21st century of our country which has replaced the 34 years old national education policy, in its first step of implementation has renamed the erstwhile Ministry of Human Resource Development (MHRD) as the Ministry of Education (MOE) as suggested by the NEP 2020. The new NEP 2020 is based on four pillars which are: Access, Equality, Quality and Accountability.

One of the major decisions of NEP 2020 is that there will be a 5+3+3+4 schooling structure emphasizing on the first five years of early childhood care and education beginning at age of three, which comprises of 12 years of school and 3 years of pre-school or anganwadi replacing old 10+2 structure. It also emphasizes on the use of mother tongue or local language as the medium of instruction till Class 5 and aims to increase state expenditure on education from around 3% to 6% of the GDP as soon as possible. For higher education it proposes a 4 year multi-disciplinary bachelor's degree in an undergraduate programme with multiple exit options and a Higher Education Commission of India (HECI) will be set up to regulate higher education.

This national seminar is an attempt to share and discuss the applicability and implementation of NEP 2020 effectively in the educational institutions across India. The conclusion drawn from the seminar would facilitate the organizers, participants and other stakeholders in making suggestions and legislative and policy based interventions to bring about positive and wholesome transformation in both social cum legal sphere.

Seminar Objectives

1. To understand the role of teachers in Higher Education in the context of NEP 2020.
2. To suggest the ways and means for effective implementation of NEP 2020
3. To suggest the strategies for enhancing the competence of teachers in Higher education

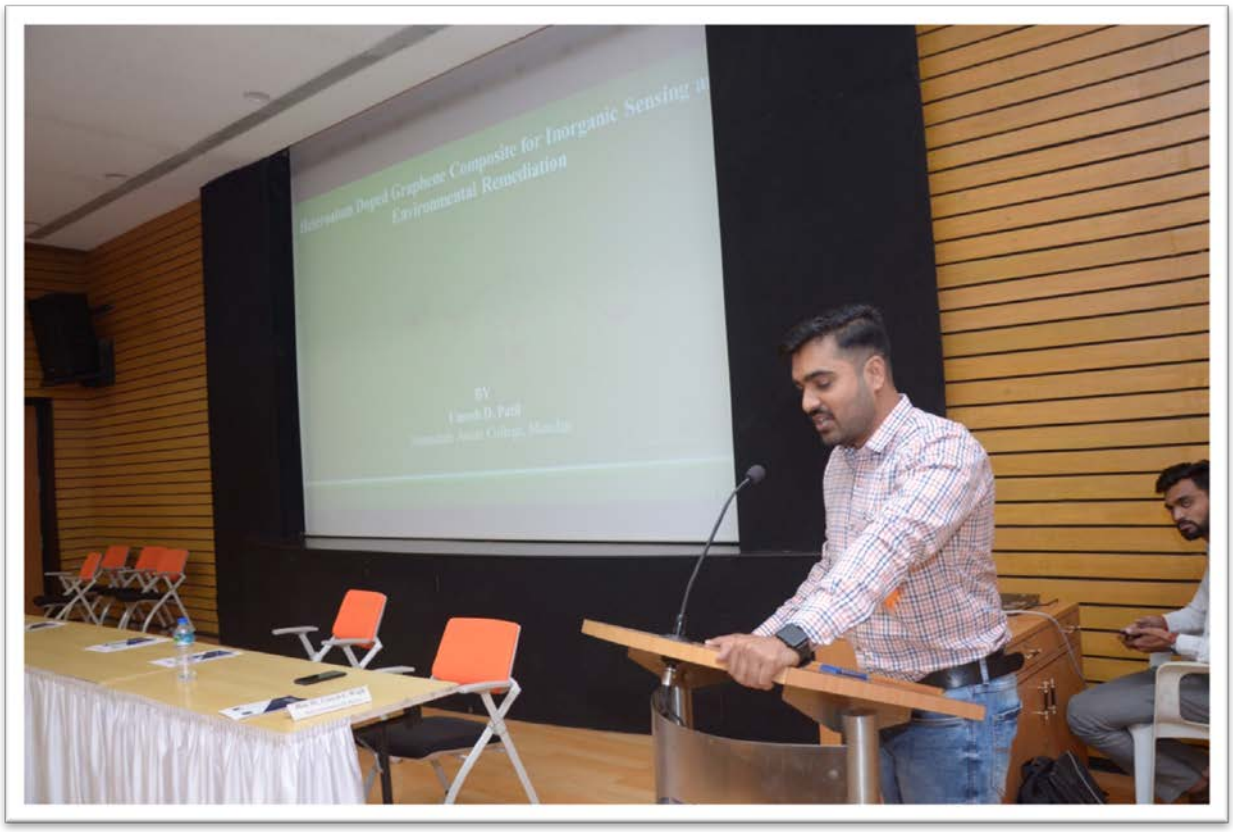
*Overview of Program:

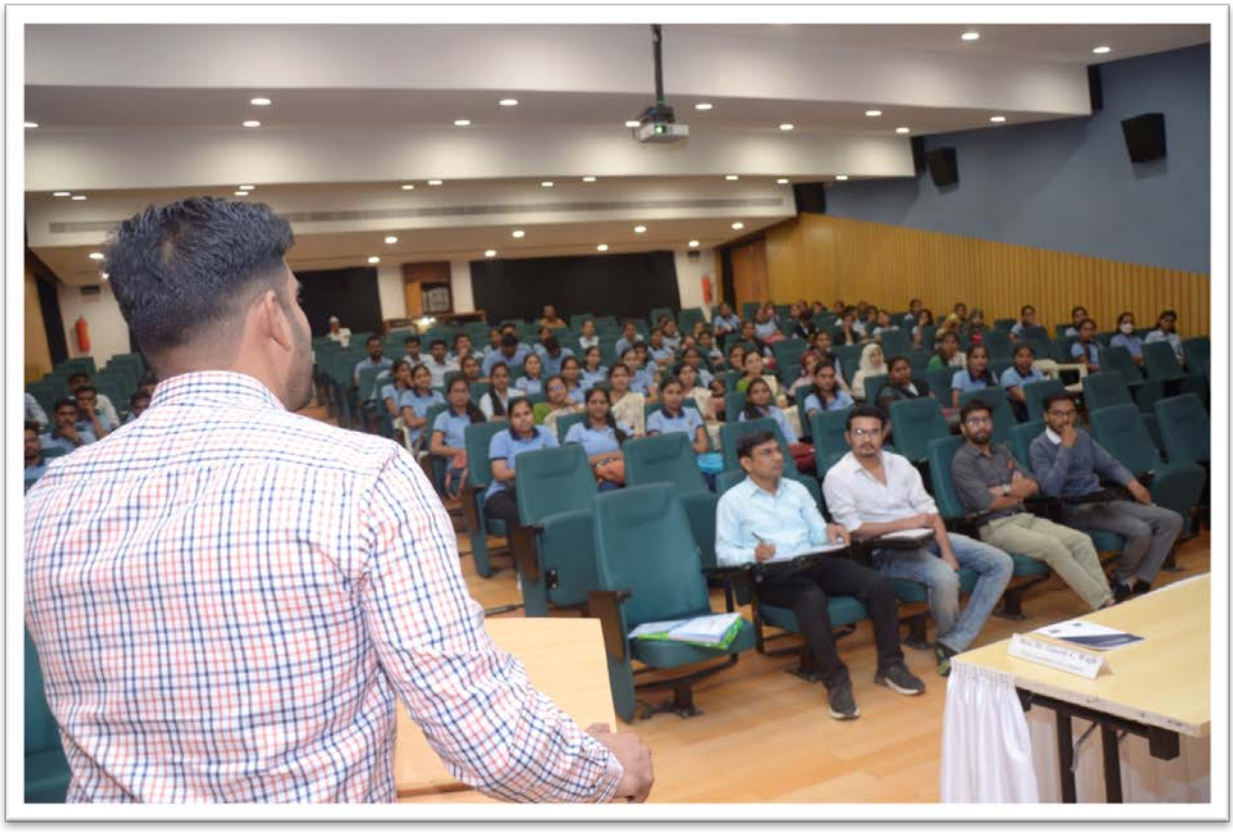
Welcoming to Delegates for State Level Seminar

Objective of Webinar (Highlighted in picture)

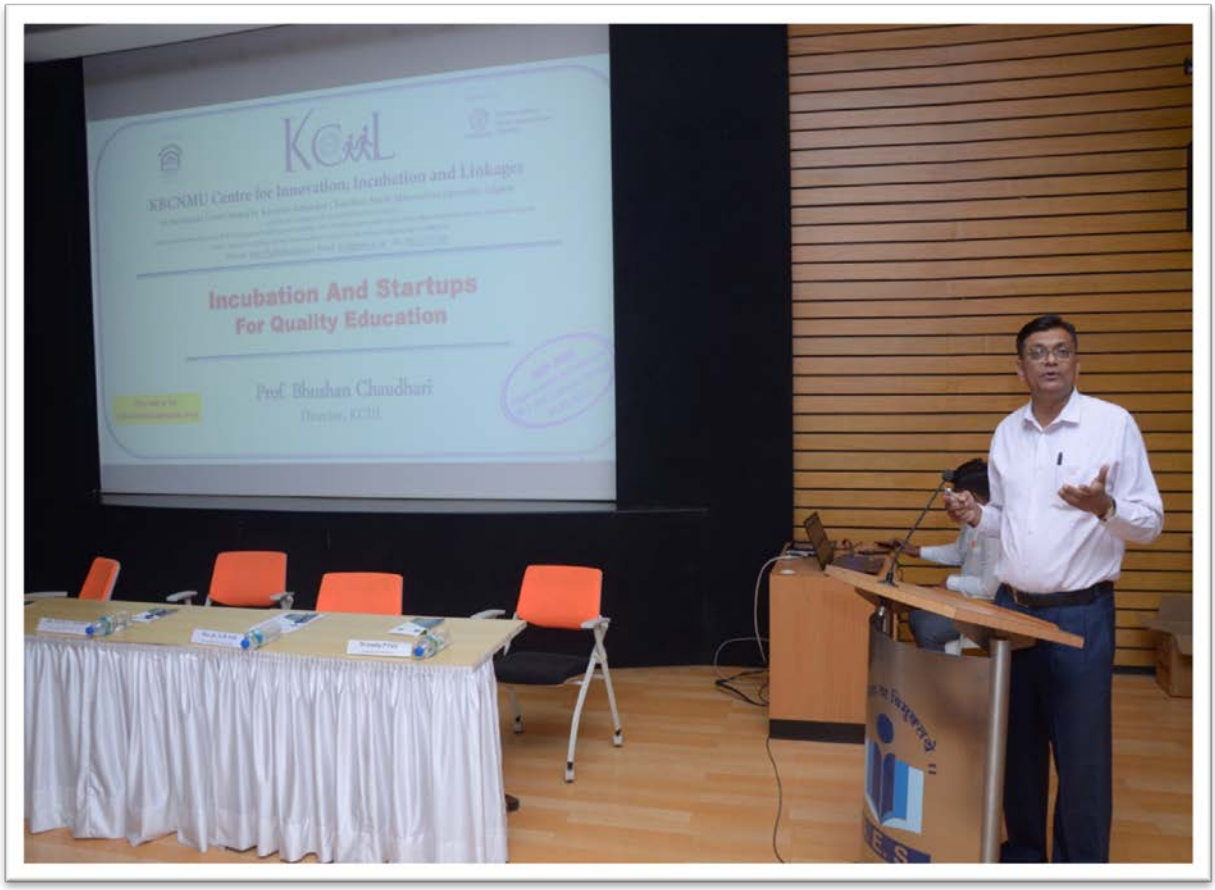
Inauguration Ceremony

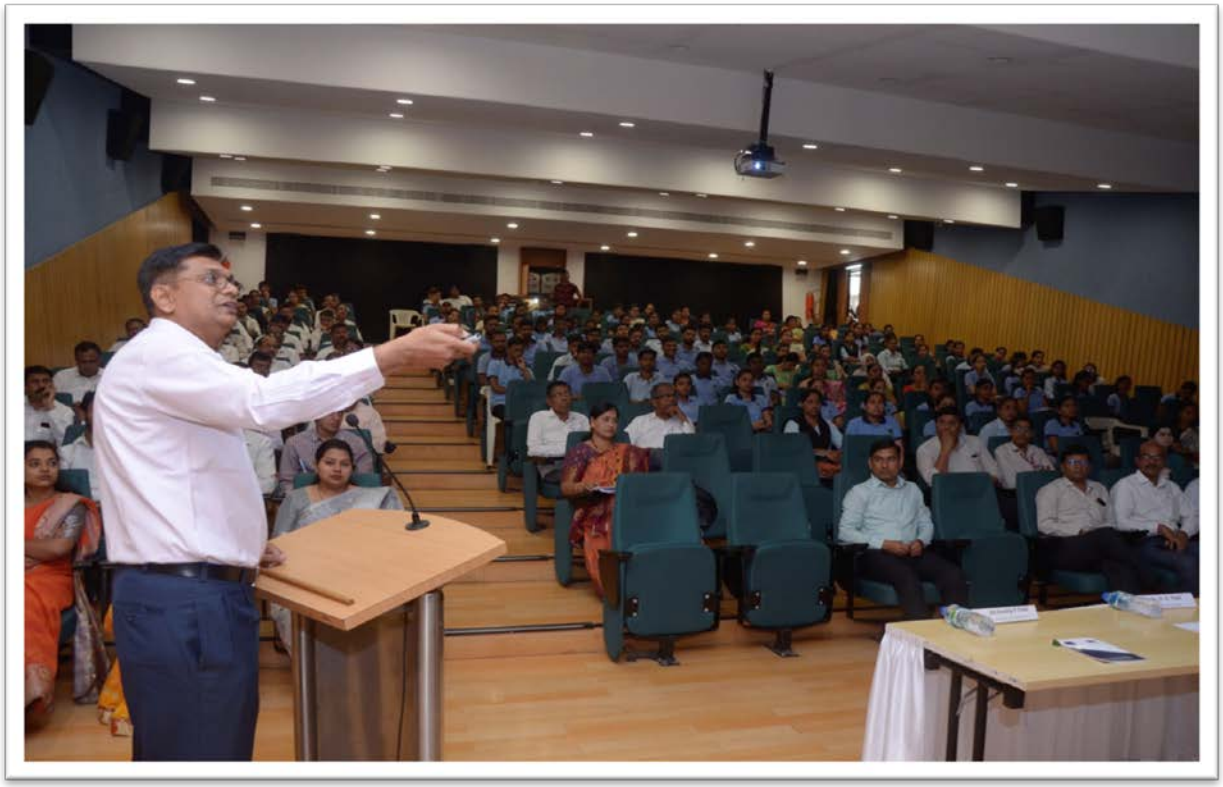
"Harmony in hymns, wisdom in verses. Saraswati Puja bliss!"





Dr. Umesh D. Patil Talk on Material for Environmental Remediation





Hon. Prof. Bhushan L. Chaudhari Talk on Incubation and Startups for Quality Education

सकाळ

शिरपूर : चर्चासत्राचे उद्घाटन करताना प्रा. डॉ. भूषण चौधरी, डॉ. विकास गिते, डॉ. संदीप पाटील आदी.

आर. सी. पटेल महाविद्यालयात राज्यस्तरीय चर्चासत्र उत्साहात

▸ सकाळ वृत्तसेवा

शिरपूर, ता. १७ : येथील आर. सी. पटेल कला, वाणिज्य व विज्ञान महाविद्यालयातील सूक्ष्मजीवशास्त्र व जैवतंत्रज्ञान विभागातर्फे एकदिवसीय राज्यस्तरीय चर्चासत्र नुकतेच पार पडले. चर्चासत्रात सुमारे १७० पदव्युत्तर विद्यार्थी, संशोधक, विद्यार्थी व शिक्षकांनी सहभाग नोंदविला.

उत्तर महाराष्ट्र विद्यापीठातील सूक्ष्मजीवशास्त्र विभागप्रमुख प्रा. डॉ. भूषण चौधरी व रसायनशास्त्र विभागातील प्रा. डॉ. विकास गिते यांनी आयपीआर व संशोधनपद्धती या विषयातील बौद्धिक संपदा संकल्पना, बौद्धिक संपदा हक्क, उदयोन्मुख समस्या आणि आव्हाने, जैवतंत्रज्ञानाची उत्क्रांती आणि पेटंट, पारंपरिकांचे संरक्षण ज्ञान, वनस्पती विविधता संरक्षण, फार्मास्युटिकल पेटंट आणि सार्वजनिक आरोग्य क्षेत्रातील बौद्धिक संपदा हक्क जैवतंत्रज्ञान आणि जीवन विज्ञान याबाबत मार्गदर्शन केले. प्रा. तेजस चौधरी यांनी सूत्रसंचालन केले. जैवतंत्रज्ञान विभागप्रमुख प्रा. डॉ. संदीप पाटील यांनी समन्वयक म्हणून काम पाहिले. प्राचार्य डॉ. डी. आर. पाटील, उपप्राचार्य प्रा. डॉ. ए. एम. पाटील, उपप्राचार्य प्रा. डॉ. आर. डी. जाधव यांच्या मार्गदर्शनाखाली सूक्ष्मजीवशास्त्र विभागप्रमुख प्रा. डॉ. रवींद्र पाटील, प्रा. डॉ. महेश पाटील, प्रा. डॉ. अश्विनी पाटील, प्रा. डॉ. मोहिनी पाटील, प्रा. डॉ. लीना शिरसाठ, प्रा. अश्विनी सी. पाटील, प्रा. अमृता जोशी, प्रा. हर्षा परदेशी, प्रा. वर्षा जयस्वाल, प्रा. शुभम यादव, प्रा. दर्शना गवळे, प्रा. जय पाटील यांनी संयोजन केले.

लोकमत

आर.सी. पटेल महाविद्यालयात चर्चासत्राच्या उद्घाटनप्रसंगी डॉ.भूषण चौधरी, डॉ.विकास गिते, प्राचार्य डॉ.डी.आर. पाटील, डॉ.ए.एम. पाटील आदी.

पटेल महाविद्यालयात संशोधन पद्धतीवर राज्यस्तरीय चर्चासत्र

लोकमत न्यूज नेटवर्क

शिरपूर : शहरातील आर.सी. पटेल एज्युकेशनल ट्रस्ट संचलित आर.सी. पटेल कला, वाणिज्य व विज्ञान महाविद्यालयातील सूक्ष्मजीवशास्त्र व जैवतंत्रज्ञान विभागातर्फे एकदिवसीय राज्यस्तरीय चर्चासत्र घेण्यात आले.

चर्चासत्रात सुमारे १७० हून अधिक पदव्युत्तर तसेच संशोधक, विद्यार्थी व शिक्षकांनी सहभाग नोंदविला. चर्चासत्रात उ.म.वि. येथील सूक्ष्मजीवशास्त्र विभाग प्रमुख डॉ.भूषण चौधरी व रसायनशास्त्र विभागातील डॉ.विकास गिते यांचे मार्गदर्शन लाभले. आय.पी.आर. व संशोधन पद्धती या विषयावर बौद्धिक संपदा संकल्पना, बौद्धिक संपदा हक्क, उदयोन्मुख समस्या व आव्हाने, जैवतंत्रज्ञानाची उत्क्रांती आणि पेटंट, पारंपारिकांचे संरक्षण ज्ञान, वनस्पती विविधता संरक्षण, फार्मास्युटिकल पेटंट आणि सार्वजनिक आरोग्य क्षेत्रातील बौद्धिक संपदा हक्क जैवतंत्रज्ञान आणि जीवन विज्ञान यावर मार्गदर्शन केले

प्राचार्य डॉ.डी.आर. पाटील, उपप्राचार्य डॉ.ए.एम. पाटील, उपप्राचार्य डॉ.आर.डी. जाधव यांच्या मार्गदर्शनाखाली सूक्ष्मजीवशास्त्र विभाग प्रमुख डॉ.रवींद्र पाटील, जैवतंत्रज्ञान विभाग प्रमुख डॉ.संदीप पाटील, डॉ.महेश पाटील, डॉ.अश्विनी पाटील, डॉ.मोहिनी पाटील, डॉ.लीना शिरसाठ, प्रा.अश्विनी सी. पाटील, प्रा.अमृता जोशी, प्रा.हर्षा परदेशी, प्रा.वर्षा जयस्वाल, प्रा.शुभम यादव, प्रा.दर्शना गवळे, प्रा.तेजस चौधरी, प्रा.जय पाटील, गणेश सोनार, संजय मोरे आदींनी परिश्रम घेतले. सुत्रसंचलन प्रा.तेजस चौधरी यांनी केले. जैवतंत्रज्ञान विभागप्रमुख डॉ.संदीप पाटील यांनी समन्वयक म्हणून जबाबदारी पार पाडली.

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PHOTOCHEMISTRY AND MAGNETOCHEMISTRY

Sonocatalytic Degradation of Methylene Blue by MoS_2-RGO Nanocomposites

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Abstract—In this work, the MoS_2–RGO nanocomposites were successfully prepared by a lithiation assisted exfoliation method and analyzed by various spectroscopic techniques such as X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM), high-resolution transmission electron microscopy (HRTEM), and Raman spectroscopy. The sonocatalytic performance in the degradation of methylene blue (MB) under ultrasonic irradiation was investigated. The complete degradation of MB was achieved using sonocatalyst–MoS_2–RGO nanocomposites, while restacked MoS_2 show lower sonocatalytic performance. This excellent sonocatalytic activity was due to the synergistic effect of the MoS_2 and RGO. Our finding revealed that the MoS_2–RGO nanocomposites were an active catalyst for the sonocatalytic degradation of dyes. Besides, the cycling tests indicated that the MoS_2–RGO composite exhibited excellent stability. The fabricated composite could be effectively utilized for various environmental remediation applications.

Keywords: graphene, MoS_2, sonocatalyst, dye degradation, methylene blue

DOI: 10.1134/S0036024421120153

INTRODUCTION

Nowadays, water pollution is one of the major environmental threats to be resolved around the world. Due to the industrialization water gets contaminated with harmful chemicals [1, 2]. Mainly, dyes from textile, cosmetic, leather and paper industries are one of the dominant pollutants [3]. These dyes have a serious effect on the environment, even at a lower concentration. Dye pollution can affect the growth of the aquatic plants as it hinders light penetration and thus reduces photosynthesis [4, 5]. Also, it has an adequate effect on the living organism in water depending on the exposure time and concentration [3]. Therefore, the research in the direction of decolorizing of dyes before disposal into water or on open land are strongly required.

Several research groups are working in the context of the removal of dyes to avoid water pollution. There are different treatment methods used for this purpose. Many industries are using the different organic dyes, resulting presence of organic dyes in industrial water effluents. Methylene blue (MB) dye is mainly used in different industries like printing and photographic. Processes like ultrafiltration, reverse osmosis, and adsorption on activated carbon are used for removal of dyes from wastewater, although there is a serious issue associated with these processes, as they are non-destructive and only change the dyes from one phase to another. Among all the techniques, biological processes are comparatively more economical than other techniques. Along with that, there may be a possibility of production of more hazardous intermediates. There are several chemical treatment methods that are recommended for degradation of organic pollutants in wastewater such as photocatalysis [6], photo-Fenton [7], UV–H_2O_2 [8], catalytic ozonation [9], sonolysis [10], and sonocatalysis [11], etc. Among these, photo-Fenton produces iron during the treatment and removal of iron through precipitation is a somewhat complicated job. Catalytic ozonation has the shortcoming of the low half-life period of ozone. Among them, sonocatalysis method has excellent advantages in dye removal applications due to the ultrasonic waves spread in any water medium [12–14].

Graphene based materials show their best candidature in the energy and environmental applications due to their chemical stability, high electron mobility, high thermal stability and high mechanical stability. The graphene-based materials allow us to modify the catalyst properties to precise requirements. To perform the challenging task of dye removal, there are several

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BIO-INSPIRED HETEROATOM DOPED ENGINEERING OF GRAPHENE NANOMATERIAL FOR ITS ADSORPTION AND ABSORBING PERFORMANCE WITH FACILE RECYCLING

U. D. Patil Department of Physics, Annasaheb Awate College, Manchar, Tal: Ambegaon Dist.: Pune - 410503., Maharashtra, India, Department of Physical Sciences, Rabindranath Tagore University Bhopal, 464993, India.

D. M. Nerkar Department of Physics, Sathaye College, Vile Parle (E), Mumbai – 400 057, Maharashtra, India.

Neetu Paliwal Department of Physical Sciences, Rabindranath Tagore University Bhopal, 464993, India.

Abstract:
The current study intends to manufacture a sulphur and nitrogen codoped reduced graphene oxide (SN-rGO) nanomaterial utilizing an easy, ecological technique, and to use it to the spectroscopic detection of heavy metal ions such as mercury (Hg^{2+}) and chromium-VI [Cr(VI)] in drinkable water. Initially, GO sheets were incorporated with S and N heteroatoms and were produced in an environmentally friendly manner utilizing Slaughterhouse waste extract as a green reducing agent. The SN-rGO nanomaterial was then investigated for their functional chemical bonding, surface morphology,, chemical structure, and elemental compositions using Fourier transform Infrared spectroscopy (FTIR), Scanning electron microscope (SEM), Energy dispersive X-ray spectroscopy (EDX), and Ultraviolet Visible spectroscopy (UV-Vis) sensing. Notably, the findings of this investigation revealed that the SN-rGO nanomaterial demonstrated a plethora of astounding properties in terms of analyte sensing. In a nutshell, UV-visible and Fourier transform infrared (FTIR) spectroscopies verified the effective synthesis of SN-rGO nanomaterial. The wrinkled, folded, and cross-linked network architectures in the SEM images verified the surface modification and sulphur and nitrogen doping in the rGO sheet, as well as the synthesis of SN-rGO. The elemental composition of the SN-rGO nanomaterial was verified using EDX. Finally, the SN-rGO probe has a lower detection limit for Hg^{2+} and Cr (VI) of 15 µM and 25 nM, respectively, due to its greater surface area, porous nature, and high carrier mobility. In summary, our findings show that SN-rGO nanomaterials have a high sensitivity to Hg^{2+} and Cr (VI) in potable water, implying that they can help with environmental cleanup.

1. Introduction:

As a result of remarkable characteristics, carbon compounds, in particular, graphene, have attracted researchers in a wide range of areas during the past few years [1]–[3]. It may be owing to its large surface area relative to other allotropes of carbon, as well as the fact that it may be utilized to create materials in many dimensions, such as 1D nanostructures, 2D layer stacked films, 3D graphene hydrogel, and aerogel, etc[4], [5]. There is a constant effort by scientists to enhance graphene in some way. In order to do this, scientists use graphite that has been oxidized to create graphene oxide (GO) [6], [7]. Defects created due to different oxygen groups available in GO can be used in various applications. GO undergoes further development, resulting in the production of reduced GO (rGO) [7]–[10]. This has led to the development of numerous rGO techniques that have certain drawbacks, such as affecting graphene's original electrical characteristics. Ion doping has been demonstrated in several published studies, regardless probability of clusters in nanocomposites. In addition, the employment of chemical reducing agents for the fabrication of rGO is dangerous, perhaps flammable, and extremely harmful to human health and the environment. As a result, the usage of such hazardous chemical agents must be avoided. Numerous biomaterials, phytochemicals, and microorganisms have been described as eco-friendly green reducing agents for rGO's encapsulation and reduction agent [11]. Researches have come up with several innovative techniques that include amino acids, vitamins, and glucose for the reduction of GO [12], [13]. It implies that the increased interest in green chemistry and ecologically friendly GO synthesis might lead to the development of numerous novel techniques towards reducing GOs as great alternatives to existing chemical procedures.

To improve the performance of graphene-based devices for a wide variety of applications, heteroatom doping of graphene has emerged as a promising study area [14]–[19]. Chemical doping allows for the tailoring of graphene's electrical characteristics, revealing a plethora of possible features that may enhance photocatalysis [20]–[24]. Although the lack of an inherent bandgap severely limits the applications of graphene in fields such as nanoelectronics, electrocatalysis, and energy storage, it is appealing to generate a bandgap from graphene in order to advance the aforementioned applications. Doping agents in substitutional doping can disrupt the sp^2 carbon network and cause the development of sp^3 defect areas via covalent interaction with graphene [20]. Doping with heteroatoms, for instance, opens up wider opportunities for altering the structural and electrical characteristics of graphene [25], [26]. Heteroatom doping induces polarisation in the sp2 hybridized network, which opens a band gap at the Dirac point by reducing the adjacent density of states and confers semiconducting characteristics to graphene [16], [17], [25], [27]. Furthermore, the altered local electronic structures significantly improve the carbon matrix's binding affinity. In light of these

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Quinoline-infused graphene carbon cages: an ecofriendly approach towards environmental remediation

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Abstract

The increasing concern over the contamination of water bodies by textile dyes calls for the development of effective and sustainable strategies for their removal. In response, this study aims to provide a comprehensive investigation on the utilization of quinoline-based graphene carbon cages as catalysts for the adsorption and absorption of malachite green, a commonly used dye in the textile industry. The synthesis of graphene carbon cages was accomplished through a facile and efficient method viz., the sonochemical method, yielding uniform structures with a hollow interior and a single-layer surface composed of thin pentagonal rings. Characterization

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Short communication

Visible active enhanced adsorptive performance of the green synthesized Sulphur and Nitrogen codoped reduced graphene Oxide towards Degradation of reactive blue 4

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ABSTRACT

The present study proposed a green way to synthesize Sulphur (S) and Nitrogen (N) codoped reduced graphene oxide (SN-rGO) employing a simple, efficient, and environmentally effective method. The graphene oxide (GO) sheets were integrated with S and N heteroatoms and were synthesized in an ecological manner employing bone meal extract (BME) as a green reducing agent. FTIR, FESEM, EDX, XPS and UV–Visible spectroscopy were used to evaluate the functional chemical bonding, surface morphology, chemical structure, and elemental compositions of the SN-rGO nanomaterial. The outcomes of the experiment have notably proved that SN-rGO possesses uncountable remarkable catalytic properties. In brief, UV–visible and Fourier transform infrared (FTIR) spectroscopies demonstrated the efficient synthesis of SN-rGO. The FESEM and HRTEM results indicated the crumbled, folded, and interconnected geometries of the networks that verified the surface modification and integration in the rGO sheets. The elemental composition of the SN-rGO nanomaterial was validated simultaneously by the EDAX and XPS analysis. The S and N doping may give additional carriers for reactive sites, hence enhancing the absorption of Reactive Blue 4 (RB4) was researched and addressed.

1. Introduction

As a consequence of extraordinary features, carbon allotropes, in precise, graphene, have captivated researchers in a broad variety of domains throughout the last several years[1–3]. It may be attributable to its huge surface area compared to other allotropes of carbon, along with the fact that it might be exploited to construct materials in multiple dimensions, such as 1D quantum dots, 2D films, 3D hydrogels and aerogels, etc. [4,5]. There is a continuing endeavour by scientists to improve graphene in some manner. In order to achieve this, scientists had employed graphite that has been oxidized to form graphene oxide (GO) [6,7]. The defects caused owing to distinct oxygen groups accessible in GO may be utilised in numerous applications. GO underwent additional evolution, culminating in the synthesis of reduced GO (rGO) [7–10]. As a result, a number of rGO approaches have emerged, each with its own set of problems, such as altering graphene's inherent electrical properties. Regardless of the frequency of clusters in nanocomposites, ion doping has been established in a number of published research. Moreover, using chemical reducing agents to make rGO is hazardous, perhaps combustible, and severely detrimental to human safety and the ecosystem. As a corollary, it is necessary to prevent the use of such dangerous chemical substances. For rGOs encapsulation and reduction agent, a variety of biomaterials, phytochemicals, and microbes have been characterized as eco-friendly green reducing agents [11]. Researchers have developed a number of novel ways for reducing GO, including the use of amino acids, vitamins, and glucose [12,13]. It signifies that the rising awareness of green chemistry and environmentally friendly GO production may contribute to the emergence of several unique strategies for reducing GOs as an excellent replacement for conventional chemical processes.

Heteroatom doping of graphene has emerged as a viable research field for improving the performance of graphene-based devices for a broad range of applications [14–19]. Chemical doping enables graphene's electrical properties to be tailored, exposing a diversity of potential photocatalytic features [20–24]. Despite the fact that the absence of an inherent bandgap significantly restricts graphene's applicability in

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NOTIFICATION

In exercise of the powers conferred under section 17 of the Madhya Pradesh Niji Vishwavidyalaya (Sthapana Avam Sanchalan) Adhiniyam, 2007 and Rabindranath Tagore University ordinance no. 16, the Vice Chancellor on behalf of the Board of Management is pleased to declare that the following candidate has qualified for the award of Degree of Doctor of Philosophy in the subject and faculty mentioned against his name.

Name	**: Umesh Dilip Patil**
Enrolment no.	**: AU182408**
Viva Voce Date	**: 31.05.2023**
Research Centre	**: Rabindranath Tagore University, Raisen (M.P.)**
Subject and Faculty	**: Physics (Science)**
Title	**: Heteroatom Doped Graphene Composite for Inorganic Sensing and Environmental Remediation**

By Order

RABINDRANATH TAGORE UNIVERSITY RAISEN

Registrar
Rabindranath Tagore University
Raisen (M.P)

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