6.5.3.

Memorandum of Understanding (MoU)

Between

Department of Geology, Government V.Y.T. PG Autonomous College, Durg, Chhattisgarh

And

Department of Geology, Government Holkar (Model Autonomous) Science College, Indore (M.P.)

Memorandum of Understanding (MoU)

Between

Department of Geology, Government V.Y.T. PG Autonomous College, Durg, Chhattisgarh

And

Department of Geology, Government Holkar (Model Autonomous) Science College, Indore (M.P.)

Government V.Y.T. PG Autonomous College, Durg, Chhattisgarh and Government Holkar (Model Autonomous) Science College, Indore (M.P.) wish to establish relations between the two institutions and agree to cooperate with each other as follows:

Subject to mutual consent, the areas of cooperation with include any programme offered at either institution as thought desirable and feasible on either side and that both sides will contribute to the fostering and development of the cooperative relationship between the two institutions. Cooperation shall be carried out through such activities as:

1. Exchange of faculty and / or staff
2. Exchange of students
3. Joint research activities and publications

The faculty exchange may assume forms, such as individual short time and long term visits of faculties, joint research and development projects. It will help the faculty to co-author publications.

The aim of the exchange program is to provide an opportunity to students to have experience of interstate cooperation and exchange, as well as better understanding of Chhattisgarh and Madhya Pradesh through education.

The institutions will endeavor to encourage students and staff to spend good period of time in the host institution and conduct study tours. A mutual agreement in writing will be documented between the parties prior to commencement of this activity. Exchange students will be accorded the rights and privileges of students in the host state in accordance with the existing regulations of the host institution relating to students and will be treated as per the terms and conditions relevant to the host institution.

The host institution agrees to assist in the seeking of appropriate housing and to supply work space, library and technical facilities as appropriate.

The financial implications of any project jointly undertaken will be decided at the time of project commencement.

This agreement will take effect from 14th August, 2021 and shall be valid for an unlimited period from this date unless sooner terminated, revoked or modified by mutual written agreement between the Parties and may be extended by mutual written agreement.

Either party may terminate the Agreement at any time during by the provision of three months written notice to the other party.

SIGNATURES

PRINCIPAL

Government V.Y.T. PG Autonomous College

Durg , Chhattisgarh

Ph. No. 0788-2359688

Email : pprinci2010@gmail.com
Website: www.govtsciencecollegedurg.ac.in

PRINCIPAL

Government Holkar (Model Autonomous)

Science College, Indore (M.P.)

Ph. No. 0731-2464074

Email : principalhsc@rediffmail.com
Website: https://www.collegeholkar.org

Witnessed by

Dr. S.D. Deshmukh

(Head, Department of Geology)

Witnessed by

Dr. V. Gadgil

(Head, Department of Geology)

MOU 6.5.3

(63)

MEMORANDUM OF UNDERSTANDING

Between

GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG, CHHATTISGARH, INDIA

(Erstwhile: Govt. Arts & Science College, Durg)

Reaccredited Grade "A+" By NAAC

College with Potential for Excellence (CPE) Phase- III By UGC

Awarded Star College by DBT, New Delhi

And

Institute for Excellence in Higher Education (IEHE), Bhopal

An Autonomous Institute established by Govt. of M.P. (College with Potential for Excellence Status Conferred by UGC)

MEMORANDUM OF UNDERSTANDING

This memorandum of understanding (MOU) is entered into by and between

Govt. V.Y.T. Postgraduate Autonomous College, Durg (C.G.)

And

Institute of Excellence in Higher Education, Bhopal, Madhya Pradesh

A. Preamble:

The University Grants Commission has realized the need for a close linkage between Higher education Institutions and Universities in terms of research and academic activities.

Government Vishwanath Yadav Tamaskar Post-Graduate Autonomous College, Durg is a leading higher education institution in Chhattisgarh, established in 1958. Presently, it is affiliated to Hemchand Yadav University, Durg (C. G.). The college has been conferred with the status of autonomy by UGC in 1989. It is accredited with grade 'A+' by NAAC in the third cycle, and has been recognized by UGC as 'College with Potential for Excellence' (CPE), receiving the grant under IIIrd Phase of the scheme. Five departments from faculty of Science and one from Social Science have been identified by UGC under CPE scheme as highly rated departments. The institute has been shortlisted and recognized under DBT Star College Scheme by the Department of Biotechnology (DBT) Govt. of India. Under this scheme 6 departments from faculty of Science have been selected for providing financial support. The Department of Chemistry was recognized for improving Science and Technology Infrastructure (FIST) Scheme by Department of Science and Technology, Govt. of India. The department of makes available around 180 undergraduates and 60 post graduates per session. The college has the distinction of being one of the 20 prominent institutions across the country to have been selected for providing suggestions on National Higher Education Qualification Framework (NHEQF) of India.

Institute for Excellence in Higher Education is an 'A' grade state level academy, envisioned to be a centre for academic excellence by the govt. of Madhya Pradesh since its inception in1995. Through an array of well structured Post–Graduate Courses, Honours Courses in Science, Arts & Commerce, and short term Vocational Courses that synergize conventional and contemporary realms of knowledge, the curriculum in industry integrated and globally embracive.

The significant milestones like Accreditation by NAAC in 'A' grade in 2004, Reaccreditation by NAAC in highest A Grade in Jan 2011, followed by third cycle of Re-accreditation by NAAC with 'A' Grade in 2016, the prestigious conferment of College with Potential for Excellence (CPE)' status in March 2010, embankment on II nd phase of CPE status spanning between 2014–2019, recognition as a nodal centre for CEQUIC (Cluster for Enhancing Quality through Innovation and Collaboration) - a scheme initiated in 2014 by the Government of Madhya Pradesh to realize international standards in research and teaching through qualitative changes, are some of the monumental achievements of the Institute. Department of Mathematics was established in the year 1995. Presently Department is running UG, PG & M. Phil. In Mathematics.

A. Purpose :

The purpose of this MOU is the mutual sharing of academic potentiality between the concerned departments of institutions in order to provide better resources and facilities to the students of either institution. This mutual sharing of resources will aid in enhancing the level of educational and related facilities available to the faculties and students.

C. Forms of co-operations :

- ✱ Visits by, and exchange of, scholars, teachers and other staff
- ✱ Joint research activities and publications
- ✱ Share the library and scientific literature facilities mutually by giving access

Role and Responsibilities:

1. General :

1.1 The faculty members of Dept. of Mathematics, Govt. V.Y.T PG. Autonomous College, Durg and Dept. of Mathematics, Institute of Excellence in Higher Education, Bhopal, Madhya Pradesh will work towards joint research projects thereby using research facilities developed / to be developed.

1.2 The faculty members of concerned departments will participate in the teaching programs in the areas of mutual interest and departmental needs.

1.3 The proposal as visiting faculty to the concerned department may be submitted and the program Coordinators shall be HODs of concerned departments.

22/08/2022

4 The faculties and students shall be allowed to library, computer and internet facilities at concerned departments.

5 Where required, Govt. V.Y.T PG. Autonomous College, Durg and Institute for Excellence in Higher Education, Bhopal shall arrange hostel / Guest house/ Accommodation for students and faculty members coming for collaborative / research work / visiting faculty.

Academic and Developmental Programs :

2.1 In the academic interest of two institutions i.e. Govt. V.Y.T PG. Autonomous College, Durg and Institute for Excellence in Higher Education, Bhopal, there will be an exchange of faculty members as per the mutual interest.

2.2 The faculty members of concerned Departments of Govt. V.Y.T PG. Autonomous College, Durg and Institute for Excellence in Higher Education, Bhopal will help each other in preparing joint research program.

2.3 Both the institutions will provide all the available facilities / manpower / guidance at vice- versa.

The Principal and the Director of both the institution will be responsible for all the proceedings under this collaboration.

Co-ordination Committee / Member / Operational authority :

One member of each institute will be responsible for the effective implementation of the MOU.

1. Dr. Rakesh Tiwari, Asstt. Professor, Dept. of Mathematics, Govt. VYT PG Autonomous College, Durg, Chhattisgarh.
2. Dr. Sabhakant Dwivedi, Professor, Dept. of Mathematics, Institute for Excellence in Higher Education, Bhopal, Madhya Pradesh.

If any charges / expanses are to be paid by either institute for the facilities provided by the other institute, such will be decided by the coordinating members by a separate Rental and Services Agreement, which also may be modified from time to time as per the need.

Disclosure : Both the parties shall make a mention of this research partnership and collaboration on their respective website and business communications and can display a sign board mentioning the name with its logo as a collaborator.

(67) 6.53

Duration : The MOU is valid for a period of 60 months (05 years) from the date of signing.

Governing law : The contract shall be govern by the Law of India for the time ng in force. In witness whereof the parties have signed, sealed and delivered this eement on this 22 day, 07 month, 2020 year first above written in the sence of

For: Govt. VYT PG Autonomous College
Durg

(Principal)
Principal
Govt.V.Y.T.P.G. Autonomous
College Durg (C.G.)
Witnessed by

(Head, Department of Mathematics)
Professor & Head
Depetment of Mathematics
Govt. V.Y.T.P.G. Autonomous College
Durg (C.G)

For: Institute for Excellence in Higher Education
Bhopal

(Director)
DIRECTOR
INSTITUTE FOR EXCELLENCE
IN HIGHER EDUCATION
BHOPAL-462016
Witnessed by

(Head, Department of Mathematics)
Asst. Numbe CQIC

आ.क. पत्र क्र. 1442 दि. 05.08.2020 (69) 6.5.3

MEMORANDUM OF UNDERSTANDING

Between

Department of Mathematics

GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG, CHHATTISGARH, INDIA

(Erstwhile: Govt. Arts & Science College, Durg)

Reaccredited Grade "A+" By NAAC

College with Potential for Excellence (CPE) Phase- III By UGC

Awarded Star College by DBT, New Delhi

And

Department of Mathematics

& Ramanujan Research Center of Mathematics

GOVT. P.G. MADHAV SCIENCE COLLEGE, UJJAIN (M.P.)

[1812], NAAC STATUS: A. REGISTERED WITH UGC UNDER 2(F) AND UNDER 12(B)

MEMORANDUM OF UNDERSTANDING

This memorandum of understanding (MOU) is entered into by and between The Dept. of Mathematics of

Govt. V.Y.T. P.G. Autonomous College, Durg (C.G.)

And

GOVT. P.G. MADHAV SCIENCE COLLEGE, UJJAIN, Madhya Pradesh

A. Preamble:

The University Grants Commission have realized the need for a close linkage between Higher education Institutions and Universities in terms of research and academic activities.

Government Vishwanath Yadav Tamaskar Post-Graduate Autonomous College, Durg is a leading higher education institution in Chhattisgarh, established in 1958. Presently, it is affiliated to Hemchand Yadav University, Durg (C. G.). The college has been conferred with the status of autonomy by UGC in 1989. It is accredited with grade 'A+' by NAAC in the third cycle, and has been recognized by UGC as 'College with Potential for Excellence' (CPE), receiving the grant under IIIrd Phase of the scheme. Five departments from faculty of Science and one from Social Science have been identified by UGC under CPE scheme as highly rated departments. The institute has been shortlisted and recognized under DBT Star College Scheme by the Department of Biotechnology (DBT) Govt. of India. Under this scheme 6 departments from faculty of Science have been selected for providing financial support. The Department of Chemistry was recognized for improving Science and Technology Infrastructure (FIST) Scheme by Department of Science and Technology, Govt. of India. The department of Mathematics makes available around 180 undergraduates and 60 post graduates per session. It is the only Research Center of Mathematics in the Durg University. The college has the distinction of being one of the 20 prominent institutions across the country to have been selected for providing suggestions on National Higher Education Qualification Framework (NHEQF) of India.

Govt. P.G. Madhav Science College was set up in 1951 in Ujjain, a highly venerated pilgrimage center enshrining Mahakaleshwar and a place notably rich in cultural heritage, tradition and civilization in Madhya Pradesh. It became a constituent college of Vikram university, Ujjain when the latter came into existence

G. Governing law :

The contract shall be govern by the Law of India for the time being in force. In witness whereof the parties have signed, sealed and delivered this agreement on this 05 day, 08 month, 2020 year first above written in the presence of

For: Govt. VYT PG Autonomous College, Durg

(Principal)

Principal
Govt.V.Y.T.P.G. Autonomous
College Durg (C.G.)

Witnessed by

Professor & Head
Depetment of Mathematics
Govt.V.Y.T.P.G. Autonomous College
Durg (C.G.)

(Head, Department of Mathematics)

For: Govt. Madhava Science College, Ujjain

(Principal)

प्राचार्य
शासकीय माधव विज्ञान महाविद्यालय
उज्जैन म. प्र.
(दूरभाष क्र. 0734-2511803)

Witnessed by

(Head, Department of Mathematics)

Dr. V. K. Gupta
Professor and Head
Post Graduate Department of Mathematics
&
Director,
Ramanujan Research Center of Mathem
Govt Madhav Science P.G. College,
Ujjain (M.P.)

पत्र क्र. ज.वि. 1442 दि० 05.8.2020.

(73) 6.5.3

MEMORANDUM OF UNDERSTANDING

Between

GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG, CHHATTISGARH, INDIA

(Erstwhile: Govt. Arts & Science College, Durg)

Reaccredited Grade "A+" By NAAC

College with Potential for Excellence (CPE) Phase- III By UGC

Awarded Star College by DBT, New Delhi

And

बस्तर विश्वविद्यालय

जगदलपुर, बस्तर, छत्तीसगढ

MEMORANDUM OF UNDERSTANDING

This memorandum of understanding (MOU) is entered into by and between

Govt. V.Y.T. Postgraduate Autonomous College, Durg (C.G.)

And

Bastar Vishwavidyalaya, Jagdalpur (C.G.)

A. Preamble:

The University Grants Commission have realized the need for a close linkage between Higher education Institutions and Universities in terms of research and academic activities.

Government Vishwanath Yadav Tamaskar Post-Graduate Autonomous College, Durg is a leading higher education institution in Chhattisgarh, established in 1958. Presently, it is affiliated to Hemchand Yadav University, Durg (C. G.). The college has been conferred with the status of autonomy by UGC in 1989. It is accredited with grade 'A+' by NAAC in the third cycle, and has been recognized by UGC as 'College with Potential for Excellence' (CPE), receiving the grant under IIIrd Phase of the scheme. Five departments from faculty of Science and one from Social Science have been identified by UGC under CPE scheme as highly rated departments. The institute has been shortlisted and recognized under DBT Star College Scheme by the Department of Biotechnology (DBT) Govt. of India. Under this scheme 6 departments from faculty of Science have been selected for providing financial support. The Department of Chemistry was recognized for improving Science and Technology Infrastructure (FIST) Scheme by Department of Science and Technology, Govt. of India. The department of makes available around 180 undergraduates and 60 post graduates per session. The college has the distinction of being one of the 20 prominent institutions across the country to have been selected for providing suggestions on National Higher Education Qualification Framework (NHEQF) of India.

Bastar Vishwavidyalaya (BVV) is one of the major institutions of higher education in Bastar regions which predominated by tribal communities is largely devoted to post graduate studies and is widely known for its excellence in research and for its distinguished faculty. The campus located near Dharampura-2 in Jagdalpur, has immense bio-diversity and a place of silent learning which give the campus natural beauty. The Department of Computer Application was established in the year 2013. The vision was to produce professional leaders, in the field of software

development and research who shall enhance the technological strength of the region and the country.

B. Purpose :

The purpose of this MOU is the mutual sharing of academic potentiality between the concerned departments of institutions in order to provide better resources and facilities to the students of either institution. This mutual sharing of resources will aid in enhancing the level of educational and related facilities available to the faculties and students.

C. Forms of co-operations :

* Visits by, and exchange of, scholars, teachers and other staff
* Joint research activities and publications
* Share the library and scientific literature facilities mutually by giving access

Role and Responsibilities:

1. General :

1.1 The faculty members of Department of Mathematics, Govt. V.Y.T PG. Autonomous College, Durg and S.O.S. Computer Application, Bastar University, Jagadalpur will work towards joint research projects thereby using research facilities developed / to be developed.

1.2 The faculty members of concerned departments will participate in the teaching programs in the areas of mutual interest and departmental needs.

1.3 The proposal as visiting faculty to the concerned department may be submitted and the program Coordinators shall be HODs of concerned departments.

1.4 The faculties and students shall be allowed to library, computer and internet facilities at concerned departments.

1.5 Where required, Govt. V.Y.T PG. Autonomous College, Durg and Bastar University, Jagadalpur shall arrange hostel / Guest house accommodation for students and faculty members coming for collaborative / research work / visiting faculty.

2. Academic and Developmental Programs :

2.1 In the academic interest of two institutions i.e. Govt. V.Y.T PG. Autonomous College, Durg and Bastar University, Jagadalpur, there will be an exchange of faculty members as per the mutual interest.

2.2 The faculty members of concerned Departments of Govt. V.Y.T PG. Autonomous College, Durg and Bastar Vishwavidyalaya, Jagadalpur will help each other in preparing joint research program.

2.3 Both the institutions will provide all the available facilities / manpower / guidance at vice- versa.

The Principal and the Vice Chancellor of both the institution will be responsible for all the proceedings under this collaboration.

D. Co-ordination Committee / Member / Operational authority :

One member of each institute will be responsible for the effective implementation of the MOU.

1. Dr. Rakesh Tiwari, Asstt. Professor, Dept. of Mathematics, Govt. VYT PG Autonomous College, Durg, Chhattisgarh.
2. Dr. Pramod Singh, Asstt. Professor, S.O.S. in Computer Application, Bastar Vishwavidyalaya, Jagadalpur, Chhattisgarh.

If any charges / expanses are to be paid by either institute for the facilities provided by the other institute, such will be decided by the coordinating members by a separate Rental and Services Agreement, which also may be modified from time to time as per the need.

E. **Disclosure :** Both the parties shall make a mention of this research partnership and collaboration on their respective website and business communications and can display a sign board mentioning the name with its logo as a collaborator.

F. **Duration :** The MOU is valid for a period of 60 months (05 years) from the date of signing.

G. **Governing law :** The contract shall be govern by the Law of India for the time being in force. In witness whereof the parties have signed, sealed and delivered this agreement on this 13 day, 05 month, 2020 year first above written in the presence of

For: Govt. VYT PG Autonomous College, Durg

(Principal)
Principal
Govt. V.Y.T. P.G. Autonomous College Durg (C.G.)

Witnessed by

(Head, Department of Mathematics)
Professor & Head
Depetment of Mathematics
Govt. V.Y.T. P.G. Autonomous College
Durg (C.G)

For: Bastar Vishwavidyalaya, Jagadalpur

(Registrar)
Bastar University
Jagdalpur (C.G.)

Witnessed by

(Head, S.O.S in Computer Application)

6.5.3 Quality assurance initiatives of the institution include: (10)

1. Regular meeting of Internal Quality Assurance Cell (IQAC); Feedback collected, analysed and used for improvements
2. Collaborative quality intitiatives with other institution(s)
3. Participation in NIRF
4.Any other quality audit recognized by state, national or international agencies (ISO Certification)

Year	Confernces, Seminars, Workshops on quality conducted	Academic Administrative Audit (AAA) and initiation of follow up action	Participation in NIRF along with Status.	ISO Certification. and nature and validity period	NBA or any other certification received with program specifications.	Collaborative quality initiatives with other institution(s) (Provide name of the institution and activity	Orientation programme on quality issues for teachers and students organised by the institution, Date (From-To) (DD-MM-YYYY)
2020						MoUis taken place Between Apollo College Anjora Durg and Dept. Botany(Govt. V.Y.T. P.G. Auto. College Durg)	
2020						A Collabrative work is being approved by IEC (Sickle Cell Institute Chhattisgarh, Raipur) with Daneshwar Prasad Research Scholar Botany(Govt. V.Y.T. P.G. Auto. College, Durg	
2021						MoUis taken place Between GPR Strategies and Solution , Raipur& Dept. Botany(Govt. V.Y.T. P.G. Auto. College Durg)	

PROFESSOR & HEAD
DEPARTMENT OF BOTANY
GOVT. V.Y.T.P.G. AUTO
COLLEGE, DURG (C.G.)

O/C

INSTITUTIONAL ETHICS COMMITTEE

SICKLE CELL INSTITUTE CHHATTISGARH, RAIPUR (ESTD. 2013)

(An Autonomous Institute of Govt. of Chhattisgarh), Reg. No. 4453

No./ 521 /SCIC/IEC/2020 Raipur, Dated: 31/10/2020

Certificate of Approval

To,

Mr. Dhaneshwar Prasad

Review Date :- 26th October 2020

Title :- Ethnobotanical survey and phytochemical analysis of medicinal plants used in the treatment of sickle cell anaemia in Dhamtari and Balod district of Chhattisgarh

Reference :- SCIC/IEC/2020/02/01

Department :- Dept. of Botany, Govt. VYTPG Auto. College, Durg

The Institutional Ethics Committee of Sickle Cell Institute Chhattisgarh, Raipur (C.G.), reviewed and discussed your above referenced research proposal in the meeting held on 26-10-2020.

At the convened meeting, the IEC **approved** the above proposal.

(Padma Shri Dr. A.T. Dabke)
Chairman
Ethics Committee

26/10/2020

(Dr. Hrishikesh Mishra)
Member Secretary
Ethics Committee

PROFESSOR & HEAD
DEPARTMENT OF BOTANY
GOVT. V.Y.T.P.G. AUTO
COLLEGE, DURG (C.G.)

GOVERNMENT V.Y. T. PG. AUTONOMOUS COLLEGE, DURG (C.G.)

DEPARTMENT OF BOTANY

&

GPR Strategies and Solutions, Raipur

Memorandum of Understanding (MoU)

The Department of Botany, Govt. V. Y. T. PG. Autonomous College, Durg Chhattisgarh and GPR Strategies and Solutions, Raipur have reached on Memorandum of Understanding (MoU) on dated 23/06/2021

The objective of MoU is as mentioned.

1. Academic Exchange with particular reference to develop People's Biodiversity Register and encourages members from both the institutions to collaborate and contribute.

2 To develop collaboration exchange of academic excellence of both institutions.

3. To make available the laboratory facilities and instrumentation facilities for the benefit of academic members both institutions on mutual benefits.

4 To generate combined intellectual property on mutual basis

5 To extend combined extension services to the society with common efforts.

6 The Govt. V. Y. T. PG. Autonomous College, with provide all academic property to partner for common course.

7 The college will provide all laboratory facilities to partner institute.

8 The college will provide academic comfort to the partner institute as per need.

9 The college will share expertise on mutual basis on involvement and output of the work.

10 The college will accept faculty and student exchange for academic purpose.

The GPR Strategies and Solutions, Raipur will be responsible for following liabilities.

1. The GPRSS will share academic concert with partner institute.
2. The GPRSS will provide all laboratory facilities to partner institute.
3. The GPRSS will share with all academic property with partner institute for common cause.

PROFESSOR & HEAD
DEPARTMENT OF BOTANY
GOVT. V.Y.T.P.G. AUTO
COLLEGE, DURG (C.G.)

4. The GPRSS will share expenditure on mutual basis for common academic activities.
5. The GPRSS will accept faculty and student exchange for academic purpose.

Both Institutions, Govt. V.Y. T. PG. Autonomous College, Durg and GPR Strategies and Solutions have reached on Memorandum of understanding based on above mutual liabilities on 21 June 2021 and further accept that any dispute will be subject matter of Durg jurisdiction as per rule of law of India.

As per the MoU this collaboration will be validated up to 2 (Two) years.

Principal/Director
Head,
Department of Botany,
Govt. V. Y. T. PG. Autonomous
College, Durg (Chhattisgarh).

Principal
Govt.V.Y.T.P.G. Autonomous
College Durg (C.G.)

Director
GPR Strategies and Solutions,
Raipur
(Chhattisgarh).

Director
Project Bio Diversity C.G.
GPR Strategies and Solutions Pvt Ltd
Raipur (C.G.)

GOVERNMENT V.Y. T. PG. AUTONOMOUS COLLEGE, DURG (C.G.)

GOVT. V.Y.T. PG AUTONOMOUS COLLEGE DURG, CHHATTISGARH, INDIA

DEPARTMENT OF BOTANY
&
APOLLO COLLEGE, Anjora, Durg

Memorandum of Understanding (MoU)

The Department of Botany, Govt. V. Y. T. PG. Autonomous College, Durg Chhattisgarh and Apollo College, Anjora, Durg (C.G.) have reached on Memorandum of Understanding (Mou) on dated 05/08/2020.

THE OBJECTIVES OF MOU IS AS MENTIONED.

1. To develop collaboration exchange of academic excellence of both institutions.
2. To share expertise of faculties of both institutions for mutual benefit and academic excellence.
3. To make available the laboratory facilities and instrumentation facilities for the benefit of academic members of both institutions on mutual benefits.
4. To generate combined intellectual property on mutual basis.
5. To extend combined extension services to the society with common efforts.

THE LIABILITIES OF APOLLO COLLEGE & GOVERNMENT V.Y. T. PG. AUTONOMOUS COLLEGE, DURG, C.G.

1. Both College, will provide all academic property to partner for common course.
2. The college will provide all laboratory facilities to partner institute.
3. The college will provide academic comfort to the partner institute as per need.
4. The college will share expertise on mutual basis on involvement and output of the work.
5. The college will be beneficiary of 50% share for all income generated by common efforts of both institution irrespective of proportionate involvement.
6. The college will accept faculty and student exchange for academic purpose.

Both institutions i.e. Govt. V.Y. T. PG. Autonomous College, Durg and Apollo College, Anjora, Durg (C.G.) have reached on Memorandum of Understanding based on above mutual liabilities on 2020-21 and further accept that any dispute will be subject matter of Durg Jurisdiction as per rule of law of India.

Principal
Apollo College
Anjora, Durg (C.G.)

PRINCIPAL
Apollo College
Anjora, Durg

PROFESSOR & HEAD
DEPARTMENT OF BOTANY
GOVT. V.Y.T.P.G. AUTO
COLLEGE, DURG

Principal
Govt. V.Y.T.P.G. Autonomous College
Durg (C.G.)

Principal
Govt. V.Y.T.P.G. Autonomous College Durg (C.G.)

Head Department of Botany
Govt. V.Y.T.P.G. Autonomous College
Durg (C.G.)

PROFESSOR & HEAD
DEPARTMENT OF BOTANY
GOVT. V.Y.T.P.G. AUTO
COLLEGE, DURG (C.G.)

Memorandum Of Understanding
Between
Bhanu Pratap Deo Government Post Graduate College,
Uttar Bastar, Kanker, C.G.
And
Government V.Y.T. Post Graduate Autonomous
College, Durg, C.G.

Memorandum of Understanding

Between

Bhanu Pratap Deo Government Post Graduate College,

Uttar Bastar, Kanker, C.G.

And

Government V.Y.T. Post Graduate Autonomous College,

Durg, C.G.

Memorandum of Understanding

Between

Bhanupratap Deo Government Post Graduate College, Uttar Bastar, Kanker, C.G.

And

Government V.Y.T. Post Graduate Autonomous College, Durg, C.G.

Noting that ***Bhanupratap Deo Government Post Graduate College, Uttar Bastar, Kanker, C.G. (BPDPGCK)*** is an active academic institution of Department of Higher Education Government of Chhattisgarh, leading to the award of degrees in the fields of Science, Social Science & Humanities, Commerce and Law and is affiliated to *Shaheed Mahendra Karma Vishwavidyalaya, Jagdalpur, C.G.*

Noting that ***Government V.Y.T. PG Autonomous College, Durg, C.G. (GVYTPGACD)***, is a premier Autonomous institution of Department of Higher education, Government of Chhattisgarh and is affiliated to *Hemchand Yadav Vishwavidyalaya, Durg, C.G.* This institution is mandated to execute the higher education, capacity building, training and researchers and or learners in the field of Science, Social Sciences and Humanities, Law and Commerce.

Recognizing that there is a need to offer the best opportunity for Indian and International students to benefit from obtaining professional degrees in the field of Science thus contributing to the growth of awareness in the field of Science and technologies and their applications;

Realizing that the problems related to natural resources management can be addressed by utilizing the application of Science and Technology involving various stakeholders and building their capacity to address the upcoming challenges;

Realizing that collaboration between ***BPDPGCK*** and ***GVYTPGACD*** would considerably leverage technical abilities of ***BPDPGCK*** and ***GVYTPGACD*** and enable a framework for professional education and research programs in the field of Sciences;

BPDPGCK and ***GVYTPGACD*** hereby wish to establish relations between the two institutions and agree to cooperate with each other as follows:

- Subject to mutual consent, the areas of cooperation which include any programme offered at either institution as deemed desirable and feasible on either side and that both sides will contribute to the fostering and development of the cooperative relationship between the two institutions. Cooperation shall be carried out through such activities as:-
    1. Exchange of faculty and/or staff
    2. Exchange of students
    3. Joint research activities and publications

- The faculty exchange may assume forms, such as individual short time and long-term visits of faculties, joint research and development projects. It will help the faculty to co-author publications.
- The exchange program aims to provide an opportunity for students to have experience of inter-institutional cooperation and exchange, as well as a better understanding of Chhattisgarh through education.
- The institutions will endeavor to encourage students and staff to spend a considerable time in the host institution and conduct study tours. A mutual agreement in writing will be documented between the parties prior to the commencement of this activity. Exchange students will be accorded the rights and privileges of students in the host state in accordance with the existing regulations of the host institution relating to students and will be treated as per the terms and conditions relevant to the host institution.
- The host institution agrees to assist the students and faculties in seeking appropriate housing and to supply workspace, library and technical facilities.

An Apex-Coordination Committee, consisting of the Members Principal of ***BPDPGCK*** and ***GVYTPGACD***; Head of Department of Geology are as Representatives of Principals of ***BPDPGCK*** and ***GVYTPGACD*** will coordinate the program aspects and will recommend any actions to be taken by ***BPDPGCK*** and ***GVYTPGACD*** towards the program. Heads of Geology Departments of both institutions will be the Member Secretary of the Apex-Coordination Committee.

This MoU shall come into force from ***16th Day of November In the year Two Thousand Twenty One and it will be valid up to 15th Day of November In the year Two Thousand Twenty Four.***

Dr.K.R.Dhruw
Principal
Bhanupratap Deo Post Graduate College, Uttar Bastar Kanker, C.G.

Witness:

Prof. Pradeep Singh Gour
Head, Geology

Date: 16th November, 2021

Place: Uttar Bastar Kanker, CG

Dr.R.N.Singh
Principal
Government V.Y.T.P.G.Auto. College, Durg, C.G.

Witness:

Dr. S.D.Deshmukh
Head, Geology

Date:16th November, 2021

Place: Durg, C.G.

Department of Hindi
Govt. V.Y.T. PG Autonomous College, Durg (C.G.)

Collaborative quality initiatives with other institution(s)

Collaborative initiative by the DepartmentCollaborative initiative by the Department

Organization with which MoU is signed	Month and Year of signing MoU	Duration
Govt. Digvijay College, Rajnandgaon	March 2021	3 Years
Indira Kala Evam Sangeet Vishwavidyalaya, Khairagarh	August 2021	3 Years

Head of the Department
विभागाध्यक्ष (हिन्दी)
डॉ. विश्वनाथ यादव तामस्कार
महाविद्यालय, दुर्ग (छ.ग.

Principal
Principal
Govt. V.Y.T.P.G. Autonomous
College Durg (C.G.)

6.5.3

Department of Hindi
Govt. V.Y.T. PG Autonomous College, Durg (C.G.)

Collaborative activities per year for research (2020-21)

Name of the collaborating agency with contact details	Source of financial support	Year of collaboration	Duration	Nature of the activity
Govt. Navin mahavidyalaya, Berla	Self	2020-21	Three years	Instructions and guidance for research
Govt. Danveer Tularam College, Utai	Self	2020-21	Three years	Instructions and guidance for research
Govt. Dau Uttam Sao Mahavidyalaya, Machandur	Self	2020-21	Three years	Instructions and guidance for research
Govt. Kangla Manjhi, College, Daundi	Self	2020-21	Three years	Instructions and guidance for research
Govt. Shaheed Kaushal Yadav College, Gundardehi	Self	2020-21	Three years	Instructions and guidance for research
Shri Shankaracharya Mahavidyalaya, Bhilai	Self	2020-21	Three years	Instructions and guidance for research
Sai mahavidyalaya, Sector VI, Bhilai nagar	Self	2020-21	Three years	Instructions and guidance for research
Samadhan mahavidyalaya, Bemetara	Self	2020-21	Three years	Instructions and guidance for research

Head of the Department
विभागाध्यक्ष (हिन्दी)
शास. विश्वनाथ यादव ताम्र.स्नात.
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Principal
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Microchemical Journal 155 (2020) 104755

Contents lists available at ScienceDirect

Microchemical Journal

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

Review Article

Mn-Doped ZnS Quantum dots–An Effective Nanoscale Sensor

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ARTICLE INFO

Keywords:
Quantum dots
Mn-doped ZnS quantum dots
Chemosensing
Biosensing

ABSTRACT

Quantum dots (QDs), due *inter alia* to their colourtunable symmetry, narrow emission, broad absorption, stability, and solution processibility have received an upsurge of interest in the last decade as potential materials for diverse applications. Doped QDs, in particular, have gained significant attention as a new class of luminescent materials since dopants influence the optical behaviour of QDs. Therefore, doped ZnS QDs possess conspicuous properties like longer dopant emission lifetime and lower toxicity. The dopant emission lifetimes of transition-metal ions are longer than the energy-gap and defect-related luminescence of the host as well as the biological background fluorescence to offer immense prospect for removal of background fluorescence for sensing applications. Probes based on phosphorescence or fluorescence enhancement of QDs is crucial for the development of the detection capability. This current review highlights the optical property and various sensing strategies of Mn-doped ZnS QDs that make them exceptional probes for applications in sensing. The review not only intends to present an all-encompassing study of the well-documented usages of QDs, but is also rather addressing the current promising improvements, concepts, and excellent applications in research of doped QDs for chemo- and biosensing. Over 200 publications are overviewed and considered here in the perspective of leading applications in sensing dealing with for instance, fluorescence, phosphorescence, chemiluminescence, electrochemiluminescence and biosensing features.

1. Introduction

Within a steadily increasing database, diverse nanomaterials and nanodevices evoked fascination for promising applications due to their properties and performances prominently different from their counterparts based on bulk solids and molecules. In nanoscience and nanotechnology, it is a substantial issue to understand the mechanism of action of nanomaterials and their tunability to tailor properties as the unique properties of nanoscale materials depend upon their shape, size, and structure [1]. Semiconductor nanomaterials also called quantum dots (QDs), as expected, occupy a unique place in the recent literature with an outstanding track record with high potential, dramatic consequences, and frequently controversial experimental evidence. QDs have excellent properties as robust fluorescent materials, such as, broad absorption spectra along with narrow and symmetric emission spectra and good photo-stability [2–4]. The surface properties also have substantial influences due to high surface-to-volume ratios of these fluorescent QDs [5]. When the spatial dimensions are reduced in a nanometre range, a widening of band gap is caused [6]. QDs are fluorescent nanoscale materials having a radius comparable to that of Bohr excitonic radius of the material [7]. These small nanocrystals can cater the requirements of modern applications, such as biolabels [8,9], sensors [10,11], lasers [12,13], light-emitting diodes [14,15], and in medicines [16]. Moreover, QDs are good components in optical gain devices, regenerative solar cells, and electroluminescent devices [17]. Recently, they have found applications in photocatalysis [18], organic dye removal [19], solar cells [20], cancer targeting and drug delivery [21]. Semiconducting QDs are particles having their physical dimensions between 1 and 10 nm and are composed of groups II–VI or III–V atoms [22]. Furthermore the thermal and photo-stability of QDs can be easily enhanced using various strategies, like organic ligand modification strategies [23–25].

Zinc sulfide (ZnS), one of the significant II–VI semiconducting and crystalline material in QD applications and research [26], with 3.68 eV optical energy-gap for the zinc blende and 3.80 eV for the hexagonal wurtzite phase in the bulk form and high refractive index [27,28]. It also has large exciton binding energy (~40 meV) useful for applications in solar cells, flat panel display, lasers, sensors, imaging, and photocatalytic dye degradation, etc. [29–32]. Preparation of ZnS QDs using various capping agents has been reported, which revealed a strong

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https://doi.org/10.1016/j.microc.2020.104755
Received 10 January 2020; Received in revised form 19 February 2020; Accepted 19 February 2020
Available online 21 February 2020
0026-265X/

Radiation Physics and Chemistry 182 (2021) 109377

Contents lists available at ScienceDirect

Radiation Physics and Chemistry

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

Low cost highly efficient natural polymer-based radiation grafted adsorbent-I: Synthesis and characterization

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ARTICLE INFO

Keywords:
Gamma radiation
Grafting
Cationic
Anionic
Monomers
Crosslinking
Chitosan
Adsorbent

ABSTRACT

High energy Co-60 gamma radiation was used to graft cationic and anionic monomers onto radiation crosslinked chitosan through mutual radiation grafting technique. The absorbed dose for synthesizing adsorbent of good strength and adsorption capacity was monomer specific. The grafting extent increased with the increase in radiation dose, dose rate and monomer concentration. While a decrease in grafting extent was observed with the increase in crosslinking density of chitosan backbone. The grafted products were characterized for water uptake capacity, surface morphology, thermal stability and elemental analysis by SEM, TGA and EDXA respectively.

1. Introduction

Cellulose and chitin are among the natural polymers that are abundant in nature and can adsorb inorganic and organic pollutants from water (Mansoori et al., 2020). Their low cost and abundance provide great incentive to develop new adsorbents based on these polymers (Basso et al., 2002). Chitosan, an N-deacetylated derivative of chitin is the second most abundant natural biopolymer (after cellulose), made up of D-glucosamine residues. It is extracted from the waste of fishery industry. Chitosan, due to the presence of large number of amino groups in its chain, exhibits pH sensitive behaviour as a weak polybase. However, its hydrophilic character and presence of amino group contributes to its poor mechanical properties strength and solubility in acids. The pH sensitivity of chitosan limits its applications in various fields like biomedicine, waste water treatment, functional membranes, flocculation etc. (Labidi et al., 2019; Vijayasri et al., 2019a; El-Hefian et al., 2012). Thus, it is more of a compulsion to modify chitosan to widen its applications.

Among various methods of polymer modification, graft copolymerization is most easy and attractive. It allows the formation of functional derivatives by covalent binding of a graft molecule onto parent polymer backbone. Grafting of suitable monomers onto chitosan can introduce properties like chelation, complexation, bacteriostatic or adsorption without affecting its inherent properties such as mucoadhesive, biocompatibility, biodegradability etc. Grafting can be initiated chemically, photo-chemically or using ionizing radiation (Goel et al., 2009a, 2011; Vijayasri et al., 2019b). Grafting through ionizing radiation has inherent advantages like absence of any initiator, uniform grafting and it is room temperature process thus even thermo-sensitive polymers can be grafted through this route (Bhattacharya and Misra, 2004; Goel et al., 2013).

Radiation grafting of two monomers onto radiation crosslinked chitosan was investigated. This part of study reports effect of experimental parameters on radiation induced grafting of two water soluble monomers with strong cationic and anionic groups onto chitosan through mutual radiation grafting technique. High energy gamma radiation from Co-60 source was used for grafting. Irradiation generates active radical sites onto backbone either directly or due to abstraction reaction with radiolytically generated species in bulk of the grafting medium (Goel et al., 2009b; Chaudhari et al., 2016a, 2016b). The grafting generates a comb like structure which enhances extent of adsorption as well as uptake kinetics of molecule of interest. Chitosan like other natural polymers, undergoes degradation on exposure to ionizing radiation, therefore it was first crosslinked using gamma radiation under suitable conditions and later crosslinked chitosan was used as backbone matrix for grafting. The novelty of the work lies in the fact that the grafted adsorbent would not put any load on the environment, the backbone polymer a being biodegradable matrix. The nitrogen being a constituent

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https://doi.org/10.1016/j.radphyschem.2021.109377
Received 7 December 2020; Received in revised form 21 January 2021; Accepted 26 January 2021
Available online 1 February 2021
0969-806X/

6.5.3

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This is to certify that:

1. Certifies that the Institute welcomes participation of **Dr. Sunil Hemraj Ganatra** as the Principal Investigator and **Dr. Ajay Pillay** as the Co-investigator/s for the project titled **Investigation of cell level percolation of commonly used pesticides in Indian agriculture.** and that in the unforeseen event of discontinuance by the Principal Investigator, the Principal Co-investigator will assume the responsibility of the fruitful completion of the project with due information to SERB.
2. The date of project starts from the date on which the University/Institute/Organisation/College receives the grant from SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi.
3. The investigator will be governed by the rules and regulations of University/ Institute/ Organisation/College and will be under administrative control of the University/ Institute/ Organisation/College for the duration of the project.
4. The grant-in-aid by the SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi will be used to meet the expenditure on the project and for the period for which the project has been sanctioned as mentioned in the sanction order.
5. No administrative or other liability will be attached to SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi at the end of the project.
6. The University/Institute/Organisation/College will provide basic infrastructure and other required facilities to the investigator for undertaking the research project.
7. The University/Institute/Organisation/College will take into its books all assets created in the above project and its disposal would be at the discretion of SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi.
8. The University/Institute/Organisation/College assumes to undertake the financial and other management responsibilities of the project.

Seal of University/Institute/Organisation/College

Govt. Institute of Science

Signature
Register of University/Head of the Institute/Head of the Organisation/Principal of College

Director
Govt. Institute of Science
NAGPUR.

Date:1/2/2017

61.1. 6.5.3

Facile Synthesis of Bismuth-Based Perovskite and Solvent Engineering for Improving the Crystallinity of Lead-Free Perovskite Material: A Microstructural Exploration

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Abstract—**In this work, bismuth based perovskite thin film has been synthesized and the different solvent precursor in lead-free methyl ammonium bismuth bromide ($MABiBr_3$) perovskite thin film was investigated. Initially, we have focused on the bismuth based material for the synthesis of lead-free perovskite thin film, because this material is non-toxic elements and fulfil requirements of being environmentally friendly. Moreover, bismuth is relatively stable as compared to other metal halides and has a variety of uses in the commercial application field. There were three precursor solvents used i.e., N,N-dimethylformamide (DMF), dimethyl sulfoxide (DMSO) and gamma-butyrolactone (GBL) for improving the crystallinity of the synthesized perovskite thin film and also increasing the efficiency of the synthesized material. Thus, the present work compared the effect of five different combinations of $MABiBr_3$ with various solvents, i.e. only $MABiBr_3$, $MABiBr_3$/DMSO, $MABiBr_3$/DMF, $MABiBr_3$/GBL and $MABiBr_3$ with all three DMSO, DMF and GBL. The synthesized $MABiBr_3$ perovskite thin film was characterized by X-Ray diffraction (XRD) analysis for structural investigation and the lattice strain was estimated by the Williamson−hall plot. The results showed ordinary grain size, average interlayer spacing, dislocation density, and micro strain of $MABiBr_3$ perovskite film. $MABiBr_3$/DMF/DMSO/GBL showed a good average particle size. The stress of the synthesized perovskite thin film with different solvent precursor was compressive to tensile stress as the solvent variation. The combined use of all three solvent precursors show a good response to induce crystallinity of perovskite thin film.**

Keywords—Perovskite, bismuth bromide, solvent engineering, XRD analysis

I. INTRODUCTION

Nowadays, in developing perovskite technologies, organic-inorganic metal halide perovskite and inorganic quantum dots deal with high competiveness. Additionally, for reducing the cost and promising future inventions they can be merged with abundant elements [1,2]. In the past five years, organolead based perovskites have played an important role such as a good absorber material used for future generation perovskite solar cells (PSCs). Lead (Pb) has been also used in their compositions like PbS, or $CsPbI_3$ in the quantum dot solar cells [3,4], or else $APbI_3$ (A = methylammonium or formamidinium) in PSCs [5]. However, the major concern with the lead is its toxicity. Therefore, the World Health Organization (WHO) has listed it as among 10 toxic chemicals to be restricted under some legislature's universal [6]. From that perspective, bismuth-based materials are the best substitution for replacing lead-having conglomerate. Bismuth is a pentavalent post-transition metal, it has a relatively low cost, good stability as compared to the other compounds and has more noteworthy commercial applications [2,3,7]. Furthermore, bismuth is not considered a toxic metal and less possesses hazard to the environment. It has a variety of uses, including fire extinguishers, cosmetics as well as used in common medicine named Pepto-Bismol for the relief of stomach aches [8]. Besides, Bi^{3+} has good optoelectronic properties and is the best candidate for defect tolerant compounds. Bismuth has active ns^2 lone pairs and has a tendency to create a maximum number of antibonding interactions at the valence band, consequently, defects are very low at the edges of the band [9,10]. For reciting charge transport in perovskite films, lattice uniformity and grain structure both play an important role because prominent grains with fault-free crystallinity are very important for energy-efficient devices [11-13].

There are several methods like vapor assisted [14] and solution-processed [15] techniques used for achieving the crystalline planar perovskite films. In a present effort in solvent engineering, it is found that the coordination strength of $BiBr_3$ varies with the solvent precursor, which is beneficial to give a good degree of crystallization in deposited perovskite films. For formulating $MABiBr_3$ perovskite film, GBL and DMF are commonly adapted like host solvents [16], whereas DMSO is used as an additive solvent for improving the efficiency of PSCs [17]. DMSO also improves the crystallization and enlarged grain size of $MABiBr_3$. After thermal annealing, DMSO can be completely removed from the prepared perovskite film.

In the present study, it was successfully synthesized bismuth based perovskite thin film and solvent engineering was used for various solvents like DMF, DMSO and GBL for improving the crystallization and efficiency of perovskite thin film. The effect of five different combinations of

nanomaterials

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Article

Calcium Alginate Beads with Entrapped Iron Oxide Magnetic Nanoparticles Functionalized with Methionine—A Versatile Adsorbent for Arsenic Removal

Surbhi Lilhare [1], Sunitha B. Mathew [1,*], Ajaya K. Singh [1,*] and Sónia A. C. Carabineiro [2]

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Abstract: A novel beads adsorbent, consisting of calcium alginate entrapped on magnetic nanoparticles functionalized with methionine (MFMNABs), was developed for effective elimination of arsenic from water. The material was characterized by FT-IR (Fourier Transform Infrared Spectroscopy), SEM (Scanning Electron Microscopic), XRD (X-ray Diffraction) and TEM (Transmission Electron Microscopy). The arsenic removal capacity of the material was studied by altering variables such as pH of the solution, contact time, adsorbent dose and adsorbate concentration. The maximal removal of As(III) was 99.56% under optimal conditions with an equilibrium time of 110 min and pH 7.0–7.5. The adsorption followed a second order kinetics and data best fitted the Langmuir isotherm with a correlation coefficient of R^2 = 0.9890 and adsorption capacity (q_m) of 6.6533 mg/g. The thermodynamic study showed entropy change (ΔS) and enthalpy change (ΔH) to be 34.32 J mol^{-1} K and 5.25 kJ mol^{-1}, respectively. This study proved that it was feasible to treat an As(III) solution with MFMNABs. The synthesized adsorbent was cost-effective, environmentally friendly and versatile, compared to other adsorbents. The adsorption study was carried by low cost spectrophotometric method using N- bromosuccinimide and rhodamine-B developed in our laboratory.

Keywords: arsenic (III); adsorption; magnetic nanoparticles; methionine functionalized; calcium alginate; spectrophotometric method

Citation: Lilhare, S.; Mathew, S.B., Singh, A.K.; Carabineiro, S.A.C. Calcium Alginate Beads with Entrapped Iron Oxide Magnetic Nanoparticles Functionalized with Methionine—A Versatile Adsorbent for Arsenic Removal. *Nanomaterials* **2021**, *11*, 1345. https://doi.org/10.3390/nano11051345

Academic Editor: Vincenzo Vaiano

Received: 30 March 2021
Accepted: 17 May 2021
Published: 20 May 2021

1. Introduction

Arsenic is naturally present in the crust of Earth and has long been recognized as highly toxic and carcinogenic, affecting millions of humans in the world [1,2]. Long-term exposure to arsenic gives symptoms such as vomiting, abdominal pain, diarrhea, severe gastrointestinal irritation, gastrointestinal damage, cardiac damage and several types of cancer [3]. It can result in vascular diseases like black foot disease [4,5]. Arsenic can be found in both organic and inorganic forms, as trivalent arsenite (H_3AsO_3, $HAsO_3^{2-}$ or $H_2AsO_3^-$) and pentavalent arsenate (H_3AsO_4, $HAsO_4^{2-}$, $H_2AsO_4^-$ or AsO_4^{3-}), of which the first form, As(III) is more noxious than As(V) [6]. In oxidizing conditions, arsenite converts to arsenate, and vice versa under reducing conditions. Inorganic arsenic compounds are more harmful and toxic, compared to organic arsenic compounds [7]. Inorganic and organic arsenic compounds are mainly used to preserve wood and as pesticides [8,9]. It also finds applications in many industries such as pharmaceuticals, paints, pesticide production, leather, textiles, etc. Several food supplements and care products contain trace amounts of arsenic and it is also used in medical products [10]. The maximum permissible limit for As in drinking water is 10 µg/L, as defined by the World Health Organization [11].

Journal of Hazardous Materials 409 (2021) 124840

Contents lists available at ScienceDirect

Journal of Hazardous Materials

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

Adsorption of cationic dyes, drugs and metal from aqueous solutions using a polymer composite of magnetic/β-cyclodextrin/activated charcoal/Na alginate: Isotherm, kinetics and regeneration studies

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ARTICLE INFO

Editor: Dr. H. Artuto

Keywords:
Polymer nanocomposites
Adsorption
Toxicants
Isotherm
Regeneration studies

ABSTRACT

In this work, we successfully synthesized novel polymer gel beads based on functionalized iron oxide (Fe_3O_4), activated charcoal (AC) particles with β-cyclodextrin (CD) and sodium alginate (SA) polymer (Fe_3O_4/CD/AC/SA), by a simple, reproducible and inexpensive method. These beads proved to be versatile and strong adsorbents with magnetic properties and high adsorption capacity. The composites were characterized by Fourier transform infrared spectroscopy, scanning electron microscopy, energy dispersive X-ray spectroscopy, vibrating sample magnetometry, adsorption at −196 °C, high resolution transmission electron microscopy, thermogravimetric analysis and point of zero charge measurements. Two dyes, two drugs and one metal were used to test the adsorption capability of the prepared polymer nanocomposite. The adsorbent showed good removal efficiencies for the studied pollutants, especially the cationic dyes and the metal, when compared to other low-cost adsorbents. The saturated adsorption capacity of Fe_3O_4/CD/AC/SA reached 5.882 mg g−1 for methyl violet (MV), 2.283 mg g−1 for brilliant green (BG), 2.551 mg g−1 for norfloxacin (NOX), 3.125 mg g−1 for ciprofloxacin (CPX), 10.10 mg g−1 for copper metal ion (Cu(II)). The adsorption isotherm studies showed that data fitted well with Langmuir and Temkin isotherms models. The kinetic data showed good correlation coefficient with low error function for the pseudo-second order kinetic model. The data analysis was carried out using error and regression coefficient functions for the estimation of best-fitting isotherm and kinetic models, namely: chi-square test (χ^2) and sum of the squares of errors (SSE). The activation energy was found to be 47.68 kJ mol−1 for BG, 29.09 kJ mol−1 for MV, 28.93 kJ mol−1 for NOX, 4.53 kJ mol−1 for CPX and 17.08 kJ mol−1 for Cu(II), which represent chemisorption and physisorption behavior of sorbent molecules. The polymer composites can be regenerated and easily separated from aqueous solution without any weight loss. After regeneration, the Fe_3O_4/CD/AC/SA beads still have good adsorption capacities up to four cycles of desorption and adsorption. The results indicate that the polymer gel beads are promising adsorbents for the removal of different categories of toxicants (like dyes, drugs and metal) in single adsorbate aqueous systems. Thus, the novel Fe_3O_4/CD/AC/SA beads can be effectively employed for a large-scale applications as environmentally compatible materials for the adsorption of different categories of pollutants.

1. Introduction

Several organic and inorganic contaminants, like drugs, domestic wastewater, (acid, basic or azo) dyes, heavy metals, among others, are continuously discharged into water bodies. This causes serious environmental problems and contamination (Moussavi et al., 2013; Homem and Santos, 2011; Bafana et al., 2011; Monier et al., 2012). Many pharmaceutical compounds (like antibiotics) are not completely metabolized by living bodies and are excreted as parent substances or in the form of metabolites. Often, these are not fully treated by wastewater

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https://doi.org/10.1016/j.jhazmat.2020.124840
Received 9 August 2020; Received in revised form 8 December 2020; Accepted 10 December 2020
Available online 31 December 2020

nanomaterials

MDPI

Article

Methionine-Functionalized Graphene Oxide/Sodium Alginate Bio-Polymer Nanocomposite Hydrogel Beads: Synthesis, Isotherm and Kinetic Studies for an Adsorptive Removal of Fluoroquinolone Antibiotics

Sushma Yadav [1], Anupama Asthana [1], Ajaya Kumar Singh [1,*], Rupa Chakraborty [1], S. Sree Vidya [2], Ambrish Singh [3] and Sónia A. C. Carabineiro [4]

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Citation: Yadav, S.; Asthana, A.; Singh, A.K.; Chakraborty, R.; Sree Vidya, S.; Singh, A.; Carabineiro, S.A.C. Methionine-Functionalized Graphene Oxide/Sodium Alginate Bio-Polymer Nanocomposite Hydrogel Beads: Synthesis, Isotherm and Kinetic Studies for an Adsorptive Removal of Fluoroquinolone Antibiotics. *Nanomaterials* **2021**, *11*, 568. https://doi.org/10.3390/nano11030568

Academic Editor: Athanasios C. Mitropoulos

Received: 2 December 2020
Accepted: 20 February 2021
Published: 25 February 2021

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Abstract: In spite of the growing demand for new antibiotics, in the recent years, the occurrence of fluoroquinolone antibiotics (as a curative agent for urinary tract disorders and respiratory problems) in wastewater have drawn immense attention. Traces of antibiotic left-overs are present in the water system, causing noxious impact on human health and ecological environments, being a global concern. Our present work aims at tackling the major challenge of toxicity caused by antibiotics. This study deals with the efficient adsorption of two commonly used fluoroquinolone (FQ) antibiotics, i.e., Ofloxacin (OFX) and Moxifloxacin (MOX) on spherical hydrogel beads generated from methionine–functionalized graphene oxide/ sodium alginate polymer (abbreviated Met-GO/SA) from aqueous solutions. The composition, morphology and crystal phase of prepared adsorbents were characterized by X-ray diffraction (XRD), field emission scanning electron microscopy (FE-SEM), Fourier transform infrared spectroscopy (FTIR), high-resolution transmission electron microscopy (HR-TEM) and thermogravimetric analysis/differential thermogravimetry (TGA/DTG). Batch adsorption tests are followed to optimize the conditions required for adsorption process. Both functionalized and non-functionalized adsorbents were compared to understand the influence of several experimental parameters, such as, the solution pH, contact time, adsorbent dosage, temperature and initial concentration of OFX and MOX on adsorption. The obtained results indicated that the functionalized adsorbent (Met-GO/SA) showed a better adsorption efficiency when compared to non-functionalized (GO/SA) adsorbent. Further, the Langmuir isotherm was validated as the best fitting model to describe adsorption equilibrium and pseudo second-order-kinetic model fitted well for both types of adsorbate. The maximum adsorption capacities of Met-GO/SA were 4.11 mg/g for MOX and 3.43 mg/g for OFX. Thermodynamic parameters, i.e., $\Delta G°$, $\Delta H°$ and $\Delta S°$ were also calculated. It was shown that the overall adsorption process was thermodynamically favorable, spontaneous and exothermic in nature. The adsorbents were successfully regenerated up to four cycles with 0.005 M NaCl solutions. Overall, our work showed that the novel Met-GO/SA nanocomposite could better contribute to the removal of MOX and OFX from the liquid media. The gel beads prepared have adequate features, such as simple handling, eco-friendliness and easy recovery. Hence, polymer gel beads are promising candidates as adsorbents for large-scale water remediation.

Keywords: methionine functionalized; graphene oxide; polymer nanocomposite; hydrogel beads; fluoroquinolones antibiotics; adsorption; isotherms; kinetics; thermodynamics

CIWC-2 2020

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Conference Proceedings Paper

Fabrication of Transparent ITO/Ga-Doped ZnO Coating as a Front Panel Electrode toward Efficient Thin Film Solar Cells

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Received: 29 February 2020; Accepted: 12 May 2020; Published: 13 May 2020

Abstract: Bi-layer coatings from sputtered indium tin oxide (ITO) and gallium doped zinc oxide (Ga:ZnO) were investigated for transparency in the visible range of the electromagnetic spectrum, optical rejection ability in the near infrared spectrum and conductivity for the novel quantum dot based solar cells. The multilayer stack produced at optimal oxygen partial pressure exhibit improved optical properties without to worsen the electrical ones, even after additional oxidation during the reactive sputtering of the metal-oxides. With a mean optical transmittance of 91.3% in the visible region, mean optical rejection greater than 65 % in the infrared range and resistivity lower than $0.4x10^{-2}$ Ω.cm, this coating is good candidate for front panel electrode in the CdS/ZnS core-shell quantum dots based solar cells.

Keywords: optical coatings; transmittance; CdS/ZnS core-shell quantum dots

Introduction

Transparent conductive films are important part of any optoelectronic device. Especially in the solar cell fabrication, the efficiency of the cell is strongly dependent on the quality of the transparent conductive electrode (TCE) [1]. It is preferable if the TCE can transmit more than 82-85% of the visible light with broad band of the transmission characteristic and if it can reject the infrared (IR) and ultraviolet (UV) components. Optical losses reduction is especially crucial for the non-silicon, thin film perovskites cells, where the efficiency is naturally low and each percent of loss decrease is significant for the normal work of the cell. To improve the filtering quality of the TCE, the presence of single layer of indium-tin oxide (ITO) is not enough. The deposition method and the deposition conditions are extremely important for the performance of the TCE. Among the possible methods of TCO deposition, such as CVD, spray pyrolysis, e-beam evaporation, ALD, etc., the most applicable process remains the RF sputtering due to its flexibility in the tuning of the films properties with the process parameters [2]. By the main process' parameters – sputtering voltage (power), sputtering pressure, and deposition rate - it is possible to control the main parameters of the TCO that are important for the solar cell work. Researchers firstly have tried to replace the ITO with ZnO films, because of their thermal stability, non-toxicity and lower cost. However, the absolute resistivity of the ZnO still has been too high as compared to the ITO. Metal dopants, such as Al, In or Ga, have been used to improve the electrical conductivity of the films. Recently, ZnO:Ga-graded ITO electrodes in perovskites solar cells have been reported [3]. Optical transmittance of 95%, resistivity

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Article

Cationic Dye Removal Using Novel Magnetic/Activated Charcoal/β-Cyclodextrin/Alginate Polymer Nanocomposite

Sushma Yadav [1], Anupama Asthana [1], Rupa Chakraborty [1], Bhawana Jain [1], Ajaya Kumar Singh [1,*], Sónia A. C. Carabineiro [2] and Md. Abu Bin Hasan Susan [3]

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Received: 25 November 2019; Accepted: 13 January 2020; Published: 18 January 2020

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Abstract: New magnetic iron oxide (Fe_3O_4)/activated charcoal (AC)/β-cyclodextrin (CD)/sodium alginate (Alg) polymer nanocomposite materials were prepared by direct mixing of the polymer matrix with the nanofillers. The obtained materials were utilized as nano-adsorbents for the elimination of methylene blue (MB), a hazardous water-soluble cationic dye, from aqueous solutions, and showed excellent regeneration capacity. The formation of the nanocomposites was followed by high-resolution transmission electron microscopy (HRTEM), scanning electron microscopy (SEM) equipped with energy dispersive X-ray spectrometry (EDX), Fourier-transform infrared spectroscopy (FTIR), vibrating sample magnetometer (VSM), X-ray diffraction (XRD) and adsorption of N_2 at −196 °C. The rate of adsorption was investigated varying several factors, namely contact time, pH, amount of adsorbent and MB concentration on the adsorption process. Studies dealing with equilibrium and kinetics were carried out in batch conditions. The obtained results indicated that the removal rate of MB was 99.53% in 90 min. Langmuir's isotherm fitted better to the equilibrium data of MB. Fe_3O_4/AC/CD/Alg polymer beads shows amazing adsorption capacities in the elimination of cationic dyes (2.079 mg/g for polymer gel beads and 10.63 mg g^{-1} for dry powder beads), in comparison to other adsorbent materials. The obtained adsorbent is spherical with hydrophobic cross-linked surface properties that enable an easy recovery without any significant weight loss of in the adsorbent used.

Keywords: nanocomposites; polymer beads; cationic dye; adsorption; isotherm; kinetics

1. Introduction

Several contaminants with organic and inorganic nature end up often in water sources. Some of them are dyes, which have harmful effects on the environment, animals and humans. Even when present in small amounts, dye compounds discharged into water sources can affect the aquatic life. Synthetic dyes are often utilized for different purposes, like food coloring, textiles, paper, leather, cosmetics, medicines, inks for printing, paints, lacquers, soaps and lubricants [1]. Therefore, these dyes enter the water streams, heading to the sea, avoiding domestic and industrial effluents. This creates a large health risk for aquatic and human life, as usually those organic compounds and their products have mutagenic or carcinogenic effects on humans, even at low concentrations [2]. Textile dyes are strongly colored and non-biodegradable [3,4]. Around 2% of the textile industry dyes go away as effluent.

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Article

Chloramine-T/N-Bromosuccinimide/$FeCl_3$/KIO_3 Decorated Graphene Oxide Nanosheets and Their Antibacterial Activity

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Received: 25 November 2019; Accepted: 31 December 2019; Published: 4 January 2020

Abstract: In this work, we report the synthesis of graphene oxide nanosheets (GO NS) using four different oxidants, namely, chloramine-T (CAT), $FeCl_3$, *N*-bromosuccinimide (NBS), and KIO_3. Fourier transform infrared spectroscopy (FTIR) was used to characterize the functional groups present in the synthesized GO. The microstructure analysis was performed using X-ray diffraction (XRD) and scanning electron microscopy (SEM) to investigate the morphology of GO. High-resolution transmission electron microscopy (HRTEM) studies demonstrated the nanostructure and crystalline phases of GO. The antibacterial activity of the prepared GO NS was investigated against pure cultures of *Pseudomonas pneumonia* and *Staphylococcus aureus*. The synthesized GO NS with CAT-GO (C-GO) exhibited very good antibacterial activity towards pathogens.

Keywords: graphene oxide nanosheets; oxidizing agents; antibacterial activity

1. Introduction

Graphene is an exceptional two-dimensional carbon material [1]. It has several electrical and mechanical properties, such as specific surface area, thermal conductivity, tunable band gap, etc. [2–11], which have attracted a lot of recent attention. Hence, graphene has created new opportunities and applications in the areas of capacitors [12], batteries [13], actuators [14], biosensors [15], etc.

Graphene oxide (GO) is an oxidized form of graphene with various oxygen-containing functionalities, like carboxyl and hydroxyl groups. Several physical techniques, such as epitaxial growth [16], mechanical cleavage [17] and chemical vapor deposition (CVD) [18], have been often used for the fabrication of GO. However, there is currently no efficient and cost-effective method for large-scale production of graphene flakes.

Therefore, much work has been done on the synthesis of GO. One of the most common methods to produce GO is the oxidation of graphite flakes in an aqueous medium. The most common oxidation procedure is the traditional Hummer's method [19,20]. It is widely accepted that different oxidation procedures have significant effects on the properties of the obtained GO. Nevertheless, there have been no comparative studies to understand the effect of each method on the final structure of the obtained GO and the different parameters that can be tuned or controlled. Moreover, different methods also influence the chemical surface structure of GO. In terms of applications dealing with energy, several literature reports deal with the supercapacitance behavior of GO-based electrodes obtained by the usual Hummers' method [21]. However, those studies fail to explain the reason for the chosen synthesis or to determine the best oxidation procedure for a given application.

Microchemical Journal 155 (2020) 104755

Contents lists available at ScienceDirect

Microchemical Journal

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

Review Article

Mn-Doped ZnS Quantum dots–An Effective Nanoscale Sensor

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ARTICLE INFO

Keywords:
Quantum dots
Mn-doped ZnS quantum dots
Chemosensing
Biosensing

ABSTRACT

Quantum dots (QDs), due *inter alia* to their colourtunable symmetry, narrow emission, broad absorption, stability, and solution processibility have received an upsurge of interest in the last decade as potential materials for diverse applications. Doped QDs, in particular, have gained significant attention as a new class of luminescent materials since dopants influence the optical behaviour of QDs. Therefore, doped ZnS QDs possess conspicuous properties like longer dopant emission lifetime and lower toxicity. The dopant emission lifetimes of transition-metal ions are longer than the energy-gap and defect-related luminescence of the host as well as the biological background fluorescence to offer immense prospect for removal of background fluorescence for sensing applications. Probes based on phosphorescence or fluorescence enhancement of QDs is crucial for the development of the detection capability. This current review highlights the optical property and various sensing strategies of Mn-doped ZnS QDs that make them exceptional probes for applications in sensing. The review not only intends to present an all-encompassing study of the well-documented usages of QDs, but is also rather addressing the current promising improvements, concepts, and excellent applications in research of doped QDs for chemo- and biosensing. Over 200 publications are overviewed and considered here in the perspective of leading applications in sensing dealing with for instance, fluorescence, phosphorescence, chemiluminescence, electrochemiluminescence and biosensing features.

1. Introduction

Within a steadily increasing database, diverse nanomaterials and nanodevices evoked fascination for promising applications due to their properties and performances prominently different from their counterparts based on bulk solids and molecules. In nanoscience and nanotechnology, it is a substantial issue to understand the mechanism of action of nanomaterials and their tunability to tailor properties as the unique properties of nanoscale materials depend upon their shape, size, and structure [1]. Semiconductor nanomaterials also called quantum dots (QDs), as expected, occupy a unique place in the recent literature with an outstanding track record with high potential, dramatic consequences, and frequently controversial experimental evidence. QDs have excellent properties as robust fluorescent materials, such as, broad absorption spectra along with narrow and symmetric emission spectra and good photo-stability [2–4]. The surface properties also have substantial influences due to high surface-to-volume ratios of these fluorescent QDs [5]. When the spatial dimensions are reduced in a nanometre range, a widening of band gap is caused [6]. QDs are fluorescent nanoscale materials having a radius comparable to that of Bohr excitonic radius of the material [7]. These small nanocrystals can cater the requirements of modern applications, such as biolabels [8,9], sensors [10,11], lasers [12,13], light-emitting diodes [14,15], and in medicines [16]. Moreover, QDs are good components in optical gain devices, regenerative solar cells, and electroluminescent devices [17]. Recently, they have found applications in photocatalysis [18], organic dye removal [19], solar paints [20], cancer targeting and drug delivery [21]. Semiconducting QDs are particles having their physical dimensions between 1 and 10 nm and are composed of groups II–VI or III–V atoms [22]. Furthermore the thermal and photo-stability of QDs can be easily enhanced using various strategies, like organic ligand modification strategies [23–25].

Zinc sulfide (ZnS), one of the significant II–VI semiconducting and crystalline material in QD applications and research [26], with 3.68 eV optical energy-gap for the zinc blende and 3.80 eV for the hexagonal wurtzite phase in the bulk form and high refractive index [27,28]. It also has large exciton binding energy (~40 meV) useful for applications in solar cells, flat panel display, lasers, sensors, imaging, and photocatalytic dye degradation, etc. [29–32]. Preparation of ZnS QDs using various capping agents has been reported, which revealed a strong

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https://doi.org/10.1016/j.microc.2020.104755
Received 10 January 2020; Received in revised form 19 February 2020; Accepted 19 February 2020
Available online 21 February 2020
0026-265X/

materials

MDPI

Article

Sensing Ability of Ferroelectric Oxide Nanowires Grown in Templates of Nanopores

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Received: 21 February 2020; Accepted: 8 April 2020; Published: 10 April 2020

Abstract: Nanowires of ferroelectric potassium niobate were grown by filling nanoporous templates of both side opened anodic aluminum oxide (AAO) through radiofrequency vacuum sputtering for multisensor fabrication. The precise geometrical ordering of the AAO matrix led to well defined single axis oriented wire-shaped material inside the pores. The sensing abilities of the samples were studied and analyzed in terms of piezoelectric and pyroelectric response and the results were compared for different length of the nanopores (nanotubes)—1.3 μm, 6.3 μm and 10 μm. Based on scanning electronic microscopy, elemental and microstructural analyses, as well as electrical measurements at bending and heating, the overall sensing performance of the devices was estimated. It was found that the produced membrane type elements, consisting potassium niobate grown in AAO template exhibited excellent piezoelectric response due to the increased specific area as compared to non-structured films, and could be further enhanced with the nanowires length. The piezoelectric voltage increased linearly with 16 mV per micrometer of nanowire's length. At the same time the pyroelectric voltage was found to be less sensitive to the nanowires length, changing its value at 400 nV/μm. This paper provides a simple and low-cost approach for nanostructuring ferroelectric oxides with multisensing application, and serves as a base for further optimization of template based nanostructured devices.

Keywords: ferroelectric oxide; nanostructuring; anodic aluminum oxide; nanowires; piezoelectric response; pyroelectric response; multisensor device

1. Introduction

Ferroelectric oxides are of great scientific interest as they are flexible in terms of properties such as tuning during deposition, technological compatibility with micro-/nanoelectromechanical systems (MEMS/NEMS) fabrication technology, and their applicability in energy harvesting or multisensor devices, due to their piezoelectric and pyroelectric response [1–3]. Ferroelectric nanowires could be incorporated into precise sensors, which have been found to exhibit better characteristics as compared to the bulk or thin film devices which are not nanostructured. Especially attractive are these elements when using them as small area, low power sensors in portable electronics due to the possibility of being autonomous [4,5].

There have been studies of ferroelectric oxides, such as potassium based oxides (sodium, niobium, lithium, tantalum, etc.) with potential applications in mechanical energy harvesting due to their favorable piezoelectric properties and durability at multiple activation. Their response can be precisely

Advanced Composites and Hybrid Materials
https://doi.org/10.1007/s42114-020-00153-5

ORIGINAL RESEARCH

Zinc oxide nanoparticle incorporated on graphene oxide: an efficient and stable photocatalyst for water treatment through the Fenton process

Bhawana Jain[1] · Ayesha Hashmi[1] · Sunita Sanwaria[1] · Ajaya K. Singh[1] · Md. Abu Bin Hasan Susan[2] · Ambrish Singh[3]

Received: 7 February 2020 / Revised: 1 April 2020 / Accepted: 4 May 2020

Abstract
Textile industries release a huge amount of wastewater that holds a very high ratio of toxic contaminants, such as dyes and various organic compounds. These are harmful to the environment, and their treatment is very much required for a clean and safe environment. So, our work explains the enhanced degradation of dye by heterogeneous Fenton process using zinc oxide-graphene oxide nanohybrid (ZnG) to generate hydroxyl radical from hydrogen peroxide. Initially, ZnG nanohybrid was successfully synthesized via hydrothermal process; later on, UV-visible spectroscopy is employed for absorption spectra and optical properties. The X-ray diffraction pattern is employed for determining the crystal structure and phase identification of nanoparticles. A scanning electron microscope (SEM) helped to find out the morphology. The high-resolution transmission electron microscopy (HRTEM) was used to get an average particle size (4.36–9.77 nm). Fluorescence spectroscopy was used to find electron-hole pair combination in nanohybrid compared to individual ZnO and GO. Finally, the catalytic activity of ZnG was successfully studied for brilliant green (BG) degradation via a heterogeneous Fenton process.

Keywords ZnG nanohybrid · Heterogeneous catalyst · Fenton's process · Brilliant green

1 Introduction

Nanomaterials have secured noteworthy awareness in the research world owing to their useful application, such as antibacterial activity [1], anticorrosive agent [2], water treatment [3], drug delivery [4], sensing [5], and imaging [6]. They have unique optical and electrical properties, which highly depend on quantum confinement effect [7]. The size effect of nanoparticles can bring about tremendous changes in the chemical, electronic, mechanical, and magnetic properties [8]. Nanohybrid materials involve rearrangement of electron-hole pairs, which highly affect the behavior of nanoparticles. This enhances the potential of the materials of this kind for various applications such as biomedical and environmental [9–11], sensor [12], and catalyst [13].

Graphene oxide is the oxidized form of graphene. It has many oxygen-containing functional groups and aromatic region with flat structure [14–16]. Its honeycomb arrangement and sp^2 hybridized carbon monolayer offer the potential to make composites with other nanomaterials [17]. Graphene-based nanocomposites have been appreciated for their high electrical and thermal conductivity, large surface area, high adsorption efficiency, and flexibility with zero band gap [18, 19]. These properties make it a special compound to be made as a nanohybrid, which acts as a photocatalyst [20–23] and solar cell [24, 25]. Titanium dioxide (TiO_2) and zinc oxide (ZnO) are the most widely used photocatalysts with high efficiency and both technically and commercially attractive catalysts for the degradation of dyes [26, 27]. Most of the research works now focus on the photocatalytic techniques using composite nanomaterials for the treatment of the wastewater and degrading dyes due to their high efficiency and low cost.

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s42114-020-00153-5) contains supplementary material, which is available to authorized users.

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Published online: 16 May 2020

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Article

Assessing the Photocatalytic Degradation of Fluoroquinolone Norfloxacin by Mn:ZnS Quantum Dots: Kinetic Study, Degradation Pathway and Influencing Factors

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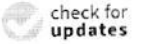
Received: 23 March 2020; Accepted: 6 May 2020; Published: 18 May 2020



Abstract: Norfloxacin (NOFX), a broadly used fluoroquinolone antibiotic, has been a subject of great concern in the past few years due to its undesirable effect on human beings and aquatic ecosystems. In this study, novel Mn doped ZnS (Mn:ZnS) quantum dots (QDs) were prepared through a facile chemical precipitation method and used as photocatalysts for NOFX degradation. Prior to photodegradation experiments, morphological and optical parameters of the QDs were examined through transmission electron microscopy, scanning electron microscopy, energy dispersive X-ray analysis, Fourier transform infrared spectroscopy, ultraviolet-visible spectroscopy, fluorescence spectroscopy, Brunauer–Emmett–Teller analysis, and differential thermal and thermogravimetric analyses. Mn:ZnS QDs exhibited excellent properties of photodegradation, not only under UV irradiation but also in sunlight, which induced NOFX to photodegrade. The utmost photodegradation efficiency was obtained under optimal conditions (25 mL of NOFX, 15 mg/L, pH 10, 60 min UV irradiation, 60 mgs QDs), adopting first order kinetics. In addition, hydroxyl radicals produced by the conduction band electrons were found to be the primary reason dominating the transformation of NOFX in basic conditions, while holes, oxygen atoms, as well as the doped metal (Mn) enhanced the degradation. The QDs showed excellent reusability and stability in four repeated cycles. Finally, four different pathways were predicted, derived from the identified intermediates, with piperazinyl ring transformation being the primary one. It is expected that the synthesized Mn:ZnS QDs could be utilized as efficient photocatalytic materials for energy conversion and ecological remediation.

Keywords: quantum dots; Mn-doped ZnS; optical properties; photocatalysis; degradation

1. Introduction

In recent years, there has been considerable worldwide expansion in the occurrence, behaviour, and fate of pharmaceutically active compounds used for the treatment of infectious diseases and for enhancing agricultural production [1]. Due to their widespread use and incomplete biodegradability, partial removal of these antibiotics is accomplished in usual wastewater treatment plants and quite large quantities are deliberately discharged into the environment. Consequently, due to the lack of effective treatments of antibiotic wastewater, these can be found in surface waters, causing unfavorable effects on aquatic and terrestrial organisms [2]. In biological treatment systems, fluoroquinolones (FQs) are

Journal of Molecular Liquids 312 (2020) 113475

Contents lists available at ScienceDirect

Journal of Molecular Liquids

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

Intensified elimination of aqueous heavy metal ions using chicken feathers chemically modified by a batch method

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ARTICLE INFO

Article history:
Received 24 February 2020
Received in revised form 16 May 2020
Accepted 27 May 2020
Available online 29 May 2020

Keywords:
Heavy metal ions
Modified chicken feathers
Adsorption isotherm
Kinetics
Thermodynamics
Regeneration

ABSTRACT

Modified chicken feathers (MCFs) were used as adsorbents for the removal of Co(II), Cu(II), Fe(II) and Ni(II) heavy metal ions from water by varying pH, adsorbent concentration and time. MCFs were characterized using Fourier Transform Infrared (FTIR) spectroscopy, Scanning Electron Microscopic (SEM) analysis, Energy Dispersive X-ray (EDX) spectroscopy. Adsorption of N_2 at −196 °C, Thermogravimetric analysis (TGA) and X-ray Diffraction (XRD) analysis. The adsorption isotherm for the metal ions could be well explained by the Langmuir model. The maximum adsorption capacities were 200.0, 50.0, 43.47, and 4.85 mg/g, following the sequence: Cu(II) > Co(II) > Fe(II) > Ni(II), respectively. Removal efficiencies of Co(II), Cu(II), Fe(II) and Ni(II) ions were 98.7%, 98.9%, 98.7% and 99%, respectively, for 20 mg/L concentration. The study of the adsorption kinetics for metal ions on MCFs confirmed that the process followed a pseudo second order kinetic model in all cases. The thermodynamics showed that the adsorption processes for metal ions adsorption on MCFs were spontaneous and endothermic. MCFs exhibited a good recyclability and high adsorption efficacy after 7 cycles using a 0.1 M EDTA solution, maintaining 90% of the adsorption ability.

1. Introduction

Many industries produce toxic wastewaters containing heavy metals and such pollution is a major problem. Mercury, arsenic, cadmium, lead, chromium, copper, nickel and cobalt are very toxic heavy metals with harmful effects [1,2]. Even low concentrations of such ions cause damages to the environment and public health, as they are non-biodegradable and highly toxic. The majority of heavy metals present in wastewater come from pesticides, fertilizers, metals present in paints, pigments, textile industries, chemical industries and battery manufacturing [3]. Copper (II), cobalt (II), iron (II) and nickel (II) are common examples of heavy metal ions commonly found in industrial wastewater.

Copper is a micronutrient essential to humans but higher concentrations of this metal, continually ingested, can have harmful effects on humans, such as Alzheimer's and Wilson diseases, liver and kidney damage, insomnia, vomiting, diarrhoea and lung cancer [4,5].The maximum limit allowed for Cu set by the American Environmental Protection Agency (EPA) for drinking water is 1.3 mg/L [6].

Cobalt is an essential dietary component to humans but is also toxic and dangerous at higher concentrations [7]. It can be found at the wastewaters of nuclear power plants and is used in various industrial applications. Severe cobalt poisoning may cause serious human health problems, such as allergic dermatitis, rhinitis, asthma, heart damage and heart failure [8].

Iron is also an essential element, with extreme importance in oxygen transportation and storage (in the forms of haemoglobin and myoglobin, both containing Fe(II) ions [9]). However, Fe can be present in high concentrations in effluents from industry, namely from steel tempering, mining and coal. The intake of high amounts of iron can cause various health problems, such as stomach pain, nausea and vomiting; in higher concentrations, cancer and fatal damages to the brain and liver.

Nickel is also toxic at higher concentrations, being found in chemical industries, electroplating, mining, refining, paints and ink formulation units [10]. Nickel can lead to a skin disease called nickel-eczema and other adverse health effects, such as nausea, chronic asthma, coughing and cancer. EPA set the maximum allowed level of nickel for drinking water as 0.015 mg/L [11].

Several techniques, including physical and chemical processes, were reported for the elimination of heavy metal ions, namely, chemical precipitation, ion exchange, adsorption, reverse osmosis, etc. [12–15].

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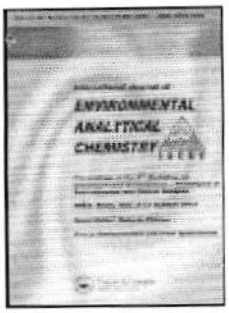
https://doi.org/10.1016/j.molliq.2020.113475
0167-7322/



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International Journal of Environmental Analytical Chemistry

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/geac20

Degradation of methylene blue and methyl violet using graphene oxide/NiO/β-cyclodextrin nanocomposites as photocatalyst

Ranjana Dewangan , Ayesha Hashmi , Anupama Asthana , Ajaya K. Singh & Md Abu Bin Hasan Susan

To cite this article: Ranjana Dewangan , Ayesha Hashmi , Anupama Asthana , Ajaya K. Singh & Md Abu Bin Hasan Susan (2020): Degradation of methylene blue and methyl violet using graphene oxide/NiO/β-cyclodextrin nanocomposites as photocatalyst, International Journal of Environmental Analytical Chemistry, DOI: 10.1080/03067319.2020.1802443

To link to this article: https://doi.org/10.1080/03067319.2020.1802443

Polyhedron 190 (2020) 114792

Contents lists available at ScienceDirect

Polyhedron

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

Praseodymium-doped cadmium tungstate ($CdWO_4$) nanoparticles for dye degradation with sonocatalytic process

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ARTICLE INFO

Article history:
Received 17 July 2020
Accepted 2 September 2020
Available online 10 September 2020

Keywords:
Remazol Black B
Sonolysis
Advanced oxidation process
Praseodymium
Cadmium tungstate
Nanoparticles

ABSTRACT

In the present work, praseodymium-doped cadmium tungstate (Pr-$CdWO_4$) nanoparticles were synthesized, characterized and used as catalysts in a sonocatalytic process to degrade the toxic synthetic azo dye Remazol Black B (RBB). RBB was degraded by 93.9% operating at optimal conditions (pH = 3, C = 100 mg/L, catalyst dosage = 0.35 g/L, T = 298 K and irradiation time100 min) under an ultrasonic bath at 60 kHz. Further, the addition of different radical scavengers and enhancers to the reaction was assessed. It was found that the addition of the radical scavengers sodium sulfate, sodium carbonate, and sodium chloride decreased RBB degradation from 93.9% to 86.0%, 78.0%, and 71.2%, respectively. On the contrary, the addition of the enhancers potassium periodate, peroxydisulfate and hydrogen peroxide slightly increased the RBB degradation from 93.9% to 95.3%, 96.1%, and 98.7%, respectively. The sonocatalytic process resulted in higher RBB degradation than by applying separately sonolysis (34.7%) and the catalyst as an adsorbent (39.5%). The experimental data followed both the pseudo-first-order (PFO) and Langmuir-Hinshelwood (L-H) kinetics models. However, the PFO gave better fitting (R^2 = 0.993) than the L-H kinetic model (R^2 = 0.9025) at the same optimum experimental conditions. The obtained results pointed out the sonocatalytic process with Pr-doped $CdWO_4$ nanoparticles as a promising process for the degradation of azo dyes and other hazardous organic compounds existing in wastewater.

1. Introduction

Advanced oxidation processes (AOPs) are appealing methods for removing pollutants from wastewater because of their simplicity and high efficiency on the removal of resistant contaminants [1–5]. AOPs are processes involving *in situ* generation of different reactive oxygen species (ROS) in solution by diverse processes such as sonolysis, ozonation, UV and Fenton processes. These ROS are highly reactive and thus, they are able to oxidize organic compounds non-selectively in a short time period [6]. Among the above-mentioned AOPs, sonolysis has attracted the interest of many researchers because of its environmental friendliness, low cost and lack of sludge generation [1]. The sonolysis process is produced by passing ultrasonic waves as a source of high energy to initiate the formation of acoustic cavitation through a liquid, and the process is also known as acoustic cavitation or ultrasonication. In this process, bubble collisions release a large amount of energy forming hydroxyl (·OH) and hydrogen radicals (·H) by the thermal dissociation of water and oxygen [1]. These radicals can oxidize dissolved recalcitrant compounds generating hydrogen peroxide (H_2O_2). However, the use of only ultrasound waves (sonolysis) to treat wastewater consumes time and a high amount of electrical energy [7]. Also, the application of sonolysis leads to a low degradation rate of organic contaminants and, in addition to this, total degradation rarely takes place [8].

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https://doi.org/10.1016/j.poly.2020.114792
0277-5387/

Polymer Bulletin
https://doi.org/10.1007/s00289-020-03342-w

ORIGINAL PAPER

Control of surface functionalization of graphene-metal oxide polymer nanocomposites prepared by a hydrothermal method

Ranjana Dewangan[1] · Anupama Asthana[1] · Ajaya K. Singh[1] · Sónia A. C. Carabineiro[2]

Received: 19 March 2020 / Revised: 30 May 2020 / Accepted: 11 August 2020

Abstract

The study of nanocomposites formed by doping of graphene oxide with a metal and polymer is presented in this paper. The graphene oxide contains oxygenated functional groups, like epoxy, hydroxyl and carboxyl, as shown by Fourier transform infrared spectroscopy (FTIR) studies. The existence of these functional groups on the surface of graphene oxide disperses the polymer chain and leads to a good interaction with the metal. The characterization of the prepared nanocomposite was done by X-ray diffraction, energy dispersive X-ray analysis, FTIR, Raman spectroscopy, scanning electron microscopy and high resolution transmission electron microscopy. The results showed that the obtained nanocomposite comprises nano-shaped thin stacked flakes with a well-defined multilayered edge structure. It was also seen that the metal particles were uniformly dispersed on the graphene surface with an average particle size of 1–25 nm. The synthesized nanocomposites can be used for adsorption and degradation of dyes.

Keywords Graphene oxide · Graphene oxide/metal oxide · Graphene oxide/metal oxide/polymer

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s00289-020-03342-w) contains supplementary material, which is available to authorized users.

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Published online: 17 August 2020

Colloid Polym Sci
DOI 10.1007/s00396-016-3921-8

ORIGINAL CONTRIBUTION

Kinetic study of oxidation of paracetamol by water-soluble colloidal MnO_2 in the presence of an anionic surfactant

Ajaya Kumar Singh[1] · **Neelam Sen**[1] · **Som Kumar Chatterjee**[2] · **Md. Abu Bin Hasan Susan**[3]

Received: 1 October 2015 / Revised: 26 May 2016 / Accepted: 11 July 2016

Abstract The kinetics of the oxidation of paracetamol [PCM] by water-soluble colloidal MnO_2 was investigated spectrophotometrically at 298 K in the absence and presence of an anionic surfactant, sodium dodecyl sulphate (SDS), in aqueous solution. The reaction was first order with respect to $[MnO_2]$, [PCM] and $[H_2SO_4]$. The effects of [Mn(II)], [salt], dielectric constant and ionic strength of the medium on the kinetics of the reaction have also been examined. Micelles of SDS in aqueous solution accelerated the reaction rate, and partitioning of MnO_2 in favour of the micellar pseudophase was remarkable. The catalytic effect of SDS in aqueous solutions has been treated by well-defined mathematical (Tuncay), Menger and Portnoy, and Piszkiewicz models. The binding constant (7.59×10^{-2} mol^{-1} dm^3), dissociation constant (32.43), rate constant in the micellar phase (5.15×10^4 s^{-1}), cooperativity index (1.98) and various thermodynamic activation parameters have been evaluated, and on the basis of the observed kinetic data, possible reaction mechanism and rate law have been proposed.

Electronic supplementary material The online version of this article (doi:10.1007/s00396-016-3921-8) contains supplementary material, which is available to authorized users.

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Published online: 28 July 2016

Keywords Kinetics · Colloidal MnO_2 · Paracetamol · Sodium dodecyl sulphate · Oxidative degradation

Introduction

Micellar catalysis has been an intriguing domain of research for the last few decades. There has been a surge of interest on catalysis of reactions by micelles of surfactants with a view to their widespread applications in chemical, industrial, pharmaceutical, environmental and biological fields. Surfactants are amphiphilic substances, and formation of micelles in aqueous solution is induced by the hydrophobic interaction among the hydrophobic moiety of the surface-active agent balanced by their hydration and electrostatic repulsive effects [1–5]. Hydrophobic substrates when dissolved in aqueous micellar solutions result in high localized concentration inside the core of the micelles and may interact with micellar aggregates (incorporated inside the core and/or bound on the surface of micelles) to enhance apparent reactivity, and as a consequence, the kinetics of a reaction may be significantly enhanced as compared to pure aqueous solution [3]. For ionic surfactants, micellization is favoured by the factors that cause reduction in the electrostatic repulsion among the hydrophilic moieties (i.e. micellar head groups) [6]. A thorough systematic study of coupled systems comprising electron transfer reaction and micelle formation process of surfactants might therefore distinctly help to understand the electron transport in enzymes [7]. Numerous studies have established beyond reasonable doubt the ability of micelles to alter the reaction rate, equilibrium and concentration of reactants within the interfacial region [8–11]. The notable attempts concern kinetic oxidation of various organic compounds like sugars [12–16], amino acid [17–21], ketones [22, 23] and drugs [24, 25] by various oxidants in the presence of micellar solutions. The oxidation of

JOURNAL OF NATURAL FIBERS
https://doi.org/10.1080/15440478.2020.1819930

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Novel and Green Reduction of Graphene Oxide by Capsicum Annuum: Its Photo Catalytic Activity

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ABSTRACT

Graphene takes concerned noteworthy consideration payable its distinctive thermal, optical as well as mechanical characteristics. There are several chemical methods are available for reduce graphene oxide (r-GO) towards graphene use by many reducing agent's alike hydrazine hydrate and its derivatives. Nevertheless, they are highly explosive and emit harmful gases. Reduction of graphene oxide (GO) employing green approaches by way of plants consumes fascinated much devotion by reason of its competence, sustainable structures, and relatively low in price. Though, the crucial constituents in green extracts and their biological degradation determinations regarding GO continue quiet not well unstated. Now present work, the GO was reduced by *capsicum annuum* (CA) extract. The ideal circumstances for bio reduction existed at volume proportion of chili extract (10 g L^{-1}) and GO (0.5 g L^{-1}) solution aimed at 8 h at 80°C. The r-GO was considered with Raman spectroscopy, Fourier transform infrared spectroscopy (FTIR), Field emission scanning electron microscopy (FESEM), X- Ray diffraction (XRD), Thermo gravimetric analysis/Differential thermal analysis (TGA/DTA), Brunauer-Emmett-Teller (BET), and zeta potential. Outcomes inveterate the oxygen-holding clusters in GO were well detached, development of topping coat on the exterior of r-GO, besides virtuous diffusion of r-GO in aquatic medium. The photo catalytic degradation of GO nano composite was 96% for methyl violet (MV) in 60 minutes.

KEYWORDS
GO; capsicum annuum; green reduction; photocatalytic activity

关键词
辣椒; 绿色减排; 光催化活性

摘要

石墨烯以其独特的热学、光学和力学特性受到人们的关注. 许多还原剂的水合肼及其衍生物可用于将氧化石墨烯（r-GO）还原成石墨烯用途. 然而，它们具有很强的爆炸性，并释放有害气体. 氧化石墨烯（GO）以其具有竞争力、结构可持续性和价格相对低廉等优点而备受关注. 然而，绿色提取物中的关键成分及其对GO的生物降解测定尚不清楚. 目前的工作是用辣椒提取物降低GO. 生物还原的理想条件为辣椒提取物（10g L-1）和GO（0.5g L-1）溶液在80℃下8h的体积比. 利用拉曼光谱、傅立叶变换红外光谱（FTIR）、场发射扫描电子显微镜（FESEM）、X射线衍射（XRD）、热重分析/差热分析（TGA/DTA）、布鲁纳-埃米特-特勒（BET）和zeta电位对r-GO进行了研究. 结果表明，GO中的含氧团簇分离良好，除在水介质中有良好的扩散外，表面有涂层的发育. GO纳米复合材料对甲基紫（MV）的光催化降解率为96%.

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Supplemental data for this article can be accessed here.

Bulgarian Chemical Communication - Special Issue, Volume XX, (pp. XX - XX) 20xx

Role of the CdS/ZnS core/shell quantum dots in the thin film lead-free perovskite solar cells

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The performance of the thin film solar cells has been enhanced in recent years by development of new materials broadening the spectral response of the cell and supressing the long wavelength absorption close to the near infrared range. Absorber layers are developed to improve the collection of photo-carriers when perovskites are used as photoelectric converting films. This is due to the easy tuning of the energy levels alignment at the films interface. For the new types of lead-free perovskites, the interaction between sulphide based absorber and the perovskite is not yet investigated. First, the deposition and processing conditions for the perovskite coatings were optimized in terms of crystallization degree and uniform surface. The perovskite films crystal morphology and the crystal growth kinetics were found to be similar like the films' morphology consisting of organic molecules having non-perovskite structure. Optimized perovskite films, containing this absorber with different thickness were applied in combination with lead-free perovskite films. Homogeneous core/shell type CdS/ZnS films with high density were produced. Simple cell construction is proposed, containing ITO/ZnO:Ga_2O_3 front panel electrode, lead-free $CH_3NH_3I_{3-x}Cl_x$ based perovskite and gold back contact. The cells were tested at open circuit conditions at different illumination intensity and different wavelength of the illuminating source. At optimal conditions the fabricated solar cells showed which 1.9% higher conversion efficiency, to the reference cell without absorber. The results demonstrated the applicability of the lead-free perovskite material and the effect of sulphide layers on the solar cell electrical parameters improvement. This is a basic step to further optimization of this technology.

Keywords: sulphide absorber layer, quantum dots, core/shell technology, perovskite photoconductor, lead-free solar cell

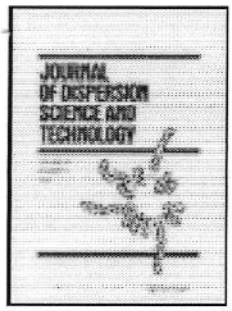
INTRODUCTION

In recent years, the Perovskite solar cells have been developed dramatically, due to their low-cost and simple fabrication, especially the hybrid ones, containing organic and inorganic constituents, such as $CH_3NH_3PbI_3$ for example [1]. For ten years the materials science technology has allowed 6 times increase in the power conversion efficiency. In 2018 has been reported about 23.3% produced from devices with size of 1 cm^2 [2].

General formula for perovskite is ABX_3, in which A is monovalent cation, B is divalent cation (i.e., Pb^{2+}/Sn^{2+}/Pd^{2+} etc.) and X is halide ion, it is the base of solar cell. ABX_3 halide perovskite is a photovoltaic material and has shown higher efficiency in solar cell technology compared to cadmium-tellurium material. By deep literature study we observed that electronic configuration of lead (Pb^{2+}) is mainly responsible for photovoltaic behavior of solar cell. Lead based perovskite solar cell still has limited use because many countries have strict regulation for use of heavy metal ions, so research now focused on making lead free perovskite solar cells [3-5].

Nowadays, the hybrid perovskite solar cells with their electrical and optical parameters are competitive to the well-established thin film technology for photoelectric convertors based on cadmium telluride CdTe and copper indium gallium selenide (CIGS). A lot of researches have been conducted to achieve this goal, related to thin film quality. It seems that the favourable behaviour of these modules is due to the broad absorption of the solar spectrum, because of the presence of lead as a core chemical element in the perovskite material. The new trends worldwide for implementation of environmental friendly materials and technologies, excluding the lead-containing substances have made further development of these solar cells senseless. The focus has been shifted on the synthesis of new, eco-friendly perovskites, in which the lead is replaced by Br, Sb, or I [6].

There are various methods were reported for synthesis of thin film of perovskite solar cell, e.g., sequential deposition, one step, vapour assisted solution process and vapour deposition method [7]. However, spin coating method is one of the best, cost effective and efficient methods [8]. An alternative approach for producing planar



Journal of Dispersion Science and Technology

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/ldis20

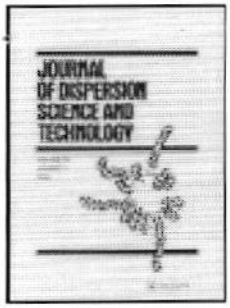
Synthesis, characterization and antibacterial activity of a graphene oxide based NiO and starch composite material

Ranjana Dewangan , Anupama Asthana , Ajaya Kumar Singh & Sónia A. C. Carabineiro

To cite this article: Ranjana Dewangan , Anupama Asthana , Ajaya Kumar Singh & Sónia A. C. Carabineiro (2020): Synthesis, characterization and antibacterial activity of a graphene oxide based NiO and starch composite material, Journal of Dispersion Science and Technology, DOI: 10.1080/01932691.2020.1844014

To link to this article: https://doi.org/10.1080/01932691.2020.1844014

Published online: 27 Nov 2020.



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Journal of Dispersion Science and Technology

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/ldis20

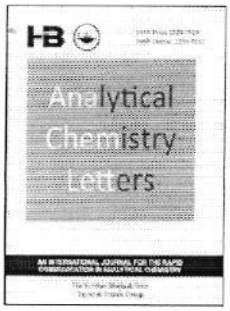
Chicken feathers derived materials for the removal of chromium from aqueous solutions: kinetics, isotherms, thermodynamics and regeneration studies

Rupa Chakraborty , Anupama Asthana , Ajaya Kumar Singh , Renu Verma , Sreevidya Sankarasubramanian , Sushma Yadav , Sónia A. C. Carabineiro & Md. Abu Bin Hasan Susan

To cite this article: Rupa Chakraborty , Anupama Asthana , Ajaya Kumar Singh , Renu Verma , Sreevidya Sankarasubramanian , Sushma Yadav , Sónia A. C. Carabineiro & Md. Abu Bin Hasan Susan (2020): Chicken feathers derived materials for the removal of chromium from aqueous solutions: kinetics, isotherms, thermodynamics and regeneration studies, Journal of Dispersion Science and Technology, DOI: 10.1080/01932691.2020.1842760

To link to this article: https://doi.org/10.1080/01932691.2020.1842760

Published online: 11 Nov 2020.



Analytical Chemistry Letters

ISSN: 2229-7928 (Print) 2230-7532 (Online) Journal homepage: https://www.tandfonline.com/loi/tacl20

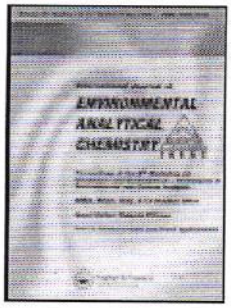
Catalytic Properties of Graphene Oxide Synthesized by a "Green" Process for Efficient Abatement of Auramine-O Cationic Dye

Bhawana Jain, Ayesha Hashmi, Sunita Sanwaria, Ajaya Kumar Singh, Md. Abu Bin Hasan Susan & Sónia A.C. Carabineiro

To cite this article: Bhawana Jain, Ayesha Hashmi, Sunita Sanwaria, Ajaya Kumar Singh, Md. Abu Bin Hasan Susan & Sónia A.C. Carabineiro (2020) Catalytic Properties of Graphene Oxide Synthesized by a "Green" Process for Efficient Abatement of Auramine-O Cationic Dye, Analytical Chemistry Letters, 10:1, 21-32, DOI: 10.1080/22297928.2020.1747536

To link to this article: https://doi.org/10.1080/22297928.2020.1747536

Published online: 03 Apr 2020.



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International Journal of Environmental Analytical Chemistry

ISSN: 0306-7319 (Print) 1029-0397 (Online) Journal homepage: https://www.tandfonline.com/loi/geac20

Adsorption of heavy metal ions by various low-cost adsorbents: a review

Rupa Chakraborty, Anupama Asthana, Ajaya Kumar Singh, Bhawana Jain & Abu Bin Hasan Susan

To cite this article: Rupa Chakraborty, Anupama Asthana, Ajaya Kumar Singh, Bhawana Jain & Abu Bin Hasan Susan (2020): Adsorption of heavy metal ions by various low-cost adsorbents: a review, International Journal of Environmental Analytical Chemistry, DOI: 10.1080/03067319.2020.1722811

To link to this article: https://doi.org/10.1080/03067319.2020.1722811

Published online: 20 Feb 2020.

RSC Advances

View Article Online
DOI: 10.1039/C6RA14955C

Hydrophilic ionic liquid-assisted control of size and morphology of ZnO nanoparticles prepared by chemical precipitation method

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Kathmandu, Nepal.

Ref. No.:-

Date: ..November 26, 2019

To
The Principal
Govt. V. Y. T. PG. Autonomous College
Durg, C.G., India

Subject: Request for the permission of collaborative research work

Respected Sir,

I am extremely delighted to write a letter to you that my two students Mr. Rajendra Joshi and Mr. Naresh Raut will visit for the collaborative research work to your college at the end of the December 2019. They will perform their research work under the supervision of Prof. Dr. Ajaya Kumar Singh, Department of Chemistry of your institution.

I humbly request you to allow the permission to both students to perform their research work and provide hospitality during their research stay in your college.

Thank you in advance for your kind consideration and help.

Sincerely

.....

Dr. Rajesh Pandit
Assistant Professor
Department of Chemistry

To

The Principal,

Govt. V.Y.T. PG. Autonomous College, Durg, (C.G.)

Subject: Permission to collaborate with HSNC Board's Smt. Chandibai Himathmal Mansukhani College, Ulhasnagar, Maharashtra and The KET's V.G. Vaze College of Arts, Science and Commerce Autonomous, Mumbai, Maharashtra to organise a National Webinar .

Sir,

Kindly grant permission to the Department of English to collaborate with HSNC Board's Smt. CHM College, Ulhasnagar, Maharashtra and The KET's V.G. Vaze College, Mumbai to organise a National Webinar on World Literature and New Literatures on 31st July 2021.

Thank you

Yours Sincerely,

Dr. Somali Gupta

Department of English

Govt. V.Y.T. PG. Autonomous College, Durg (C.G.)

Date: 26.07.2021

GOVT. V.Y.T.P.G. AUTONOMOUS COLLEGE DURG 491001(C.G.)
(Former Name — Govt. Arts & Science College, Durg)
NAAC Grade-A+, CPE Phase-III, DBT-Star College
Website: www.govtsciencecollegedurg.ac.in
Ph. 0788 2359688 Fax 0788 2359688

28.07.2021

Department of English

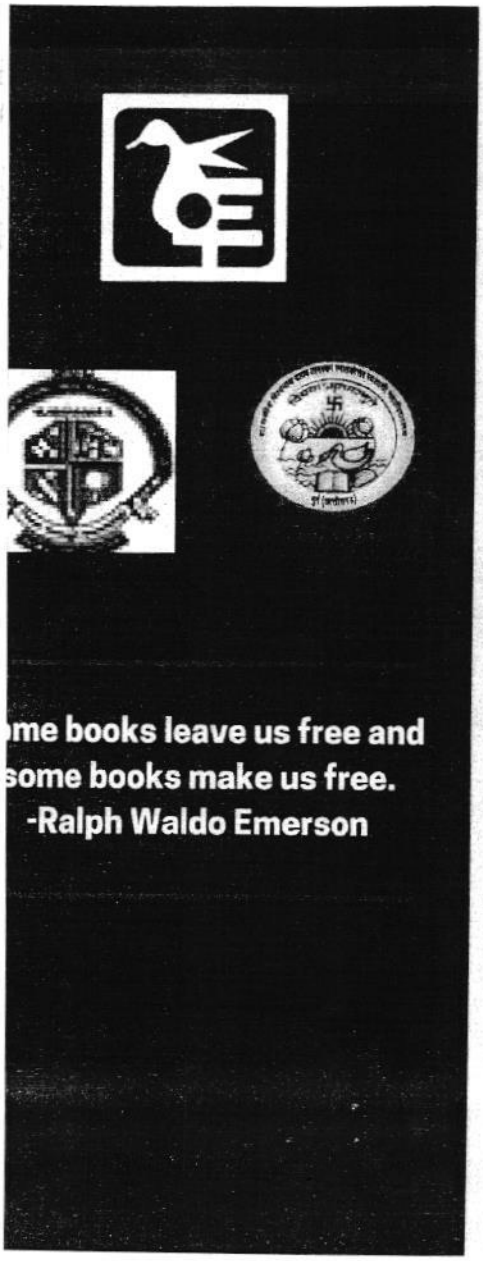
NOTICE

The Department of English, Govt. V.Y.T. PG. Autonomous College, Durg, (C.G.) in collaboration with HSNC Board's Smt. Chandibai Himathmal Mansukhani College, Ulhasnagar, Maharashtra and The KET's V.G. Vale College of Arts, Science and Commerce Autonomous, Mumbai, Maharashtra is organising a National Webinar on World Literature and New Literatures in English on 31st July 2021. Those who are interested kindly contact Dr. Somali Gupta, Convenor or for registration. The brochure with the link is attached herewith.

Dr. Somali Gupta
Co-ordinator
Govt. V.Y.T. PG. Autonomous College.
Durg, (C.G.).

Dr. R.N.Singh
Principal
Govt. V.Y.T.PG.Autonomous College
Durg, (C.G.)

Principal
Govt. V.Y.T. P.G. Autonomous
College, Durg (C.G.)



KET's V. G. Vaze College of Arts, Science and Commerce, Autonomous, Mumbai (Maharashtra),

Govt. V.Y.T. PG Autonomous College Durg (Chhattisgarh),

and

HSNC Board's Smt. C.H.M. College Ulhasnagar (Maharashtra)

Departments of English Organize

National Webinar

On

World Literature and New Literatures in English

31st July 2021

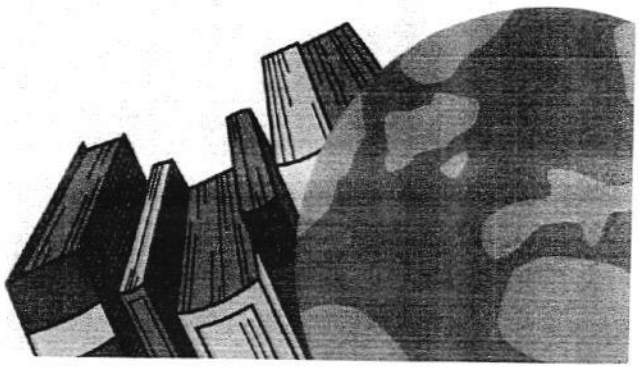
Registration link

Vorld literature, in its entirety, represents the sum of the world's national literatures and ıeir translations in English. In the past, it primarily referred to the masterpieces of uropean literature; however, it now encompasses works from across the globe, thus a ıanifestation of a global literate home.

takes a great deal of history to produce a small body of literature. Likewise, the New iteratures in English is a result of colonisation and decolonisation. These writings are from iverse cultural and geographical domains.

/ritings from Canada, New Zealand, Australia and the Caribbean form the corpus of New teratures. Literary voices have also emerged from the middle east and the Islamic world. ll these literatures have started negotiating spaces in the academic world and research.

ıis webinar aims to acquaint participants with the Literatures of Europe, Middle East and ıe Caribbean. It will bridge the gap between undergraduate and postgraduate curricula, ıd simultaneously create an awareness about the socio-cultural milieu of the specific teratures. On the whole, the session will bring about the spirit of global literary ɔnsciousness in young minds.



eratures of the Middle East

Dr.Soni Wadhwa

Assistant Professor,
Dept. of English,
SRM University, Guntur,
Andhra Pradesh

European Literature

Ms. Madhumanti Sengupta

Assistant Professor,
Dept. of English,
R.K. Talreja College,
Ulhasnagar, Maharashtra

Caribbean Literature

Dr. Dinesh Kumar Nair

Associate Professor,
Dean of Research and Head, Dep
of English,
V. G. Vaze College (Autonomous)
Mumbai, Maharashtra

REGARDS

SNC BOARD'S SMT. C.H.M. COLLEGE ULHASNAGAR, MAHARASHTRA

Dr. Manju Lalwani Pathak
Principal

Dr. Pratima Das
Associate Professor,
Vice Principal,
Head, Dept. of English

Dr. Deepa Mishra
Associate Professor,
Dept. of English

Mr. Ananda Pandhare
Assistant Professor,
Dept. of English

Ms Sana Khan
Assistant Professor,
Dept. of English

Student Co-ordinators:

Merlin Mary Benny
Nisha Narendra Duseja
Chandni Ramsajeevan Verma
Rabia Shahab Kazi

V.G. VAZE COLLEGE OF ARTS, SCIENCE AND COMMERCE (AUTONOMOUS), MUMBAI, MAHARASHTRA

Dr. B. B. Sharma
Principal

Dr. Dinesh Kumar Nair
Associate Professor,
Dean of Research,
Head, Dept. of English

Ms. Tanvi Joshi
Assistant Professor,
Dept. of English

Student Co-ordinators:
Megha Kombil
Manav Dey
Swara Bhagwat
Saino Varghese
Malini Ganeshan
Vinaya Yendhe

Organizing Secretaries:
Ms. Sundari Johnson
Assistant Professor, Dept. of English,
V.G.Vaze College

Dr. Kailas Aute
Associate Professor, Dept. of English,
CHM College

GOVT. V.Y.T. PG AUTONOMOUS COLLEG DURG, CHHATTISGARH

Dr.R.N.Singh
Principal

Prof. Dr. Somali Gupta
Dept. of English

Prof. Dr. Suchitra Gupta
Dept. of English

Prof. Dr. Qamar Talat
Dept. of English

Dr. Tarlochan Kaur
Assistant Professor,
Dept. of English

Research Scholars:

Shisirkana Bhattacharya
Parul Pandey

Registration Link

The Departments of English of

KET's V. G. Vaze College of Arts, Science and Commerce, Autonomous, Mumbai, Maharashtra,
Govt. V.Y.T. PG Autonomous College, Durg, Chhattisgarh,
and
HSNC Board's Smt. C.H.M. College, Ulhasnagar, Maharashtra

organize a National Webinar on
World Literature and New Literatures in English

DATE: **31st July 2021**
TIME: **2:00 PM**
PLATFORM: **Zoom**

Resource Persons:

Literatures of the Middle East
Dr. Soni Wadhwa
Assistant Professor,
Dept. of English, SRM University, Guntur District, Andhra Pradesh

European Literature

R.K. Talreja College, Ulhasnagar, Thane

Caribbean Literature

Dr. Dinesh Kumar Nair

Dean, Research and HOD, English

Associate Professor,

V. G. Vaze College, Autonomous,

Mumbai, Maharashtra

Registration link :

https://docs.google.com/forms/d/e/1FAIpQLScMExIMm1uodkn40HnOqqnEXsMQEDpCV4vLnXK-9kL6eg3_5w/viewform?usp=sf_link

WhatsApp group:

https://chat.whatsapp.com/EipPWVJ3ENg2Nqs7sWAgFO

All the details will be shared on the WhatsApp group.

E-Certificates will be provided after the submission of the feedback form.

Please refer to the brochure attached with this message for further details.

Regards.

To

The Principal,

Govt. V.Y.T. PG. Autonomous College, Durg, (C.G.)

Subject: Permission to collaborate with HSNC Board's Smt. Chandibai Himathmal Mansukhani College, Ulhasnagar, Maharashtra and The KET's V.G. Vaze College of Arts, Science and Commerce Autonomous, Mumbai, Maharashtra to organise a 2 day workshop.

Sir,

Kindly grant permission to the Department of English to collaborate with HSNC Board's Smt. CHM College, Ulhasnagar, Maharashtra and The KET's V.G. Vaze College, Mumbai to organise a 2 day workshop on Research Methods in English Studies (Language and Literature) from 25th -26th August 2021.

Thank you

Yours Sincerely,

Dr. Qamar Talat

Department of English

Govt. V.Y.T. PG. Autonomous College, Durg (C.G.)

Date: 21.08.2021

GOVT. V.Y.T.P.G. AUTONOMOUS COLLEGE DURG 491001(C.G.)
(Former Name — Govt. Arts & Science College, Durg)
NAAC Grade-A+, CPE Phase-III, DBT-Star College
Website: www.govtsciencecollegedurg.ac.
Ph. 0788 2359688 Fax 0788 2359688

Date : 23.08.2021

Department of English
NOTICE

The Department of English, Govt. V.Y.T. PG. Autonomous College, Durg, (C.G.) in collaboration with HSNC Board's Smt. Chandibai Himathmal Mansukhani College, Ulhasnagar, Maharashtra and The KET's V.G. Vale College of Arts, Science and Commerce Autonomous, Mumbai, Maharashtra is organising a Two-Day National Level Workshop on 'Research Methods in English Studies (Language and Literature) from 25th to 26th August 2021. Those who are interested kindly contactDr. Suchitra Gupta, Convenor or Dr. Qamar Talat, Organising Secretary for registration. A nominal fee of Rs 100 is payable towards the registration. The brochure with the link is attached herewith.

Dr. Qamar Talat.
Organising Secretary.
Govt. V.Y.T. PG. Autonomous College.
Durg, (C.G.).

Dr. R.N.Singh
Principal
Govt. V.Y.T.P.G.Autonomous College
Durg, (C.G.)

Principal
GOVT. V.Y.T. P.G. AUTONOMOUS
College, Durg (C.G.)

DEPARTMENT OF ENGLISH
GOVT. V.Y.T.P.G. AUTONOMOUS COLLEGE, DURG 491001(C.G.)
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Ph.: 0788-2359688, Fax: 0788-2359688
Website: www.govtsciencecollegedurg.ac.in

PRESS RELEASE

2-Day National Level Workshop on Research Methods in English Studies (Language and Literature)

A two day national level workshopon Research Methods in English Studies(Language and Literature) was organized by Department of English, Govt. V.Y.T PG Autonomous College Durg,; HSNC Board's Smt. C.H.M College, Ulhasnagar and The KET's V.G.Vaze College of Arts, Science and Commerce Autonomous, Mumbaion 25th and 26th August.It was for the first time that a research platform was introduced which was formed by the collaboration of three colleges. The workshop was intendedto provide the participants with the introduction of basics of research in Humanities including methods and tools of research and new directions in the field of English literature and language. On the first day, the workshop started with the address note by the Principals of all three colleges- Dr.R.N.Singh, Govt. VYT PG College; Dr. B.B.Sharma, V.G.Vaze College and Dr. Manju Lalwani Pathak, Smt. C.H.M College.Concept note was delivered by Dr.Somali Gupta, Professor, Govt. V.Y.T PG College . The two sessionson the first day were taken by Dr. Sunila Pillai, Associate Professor, R.K.Talreja College, Ulhasnagar on 'Tenets and Tools of Research in Sociolinguistics' and the other by Dr. Anusha Ramanathan, Assistant Professor, Tata Institute of Social Science, Mumbai on 'Mixed Methods Research: Tools and Strategies'. On the second day, the first session was taken up by Dr.LaksmiMuthukumar, Professor, South Indian Educational Society's College of Arts, Science and Commerce, Mumbai on 'Debunking Myths, Realizing Research' and the second session by Dr. Annie Joshi, Associate Professor, A.R.BurlaMahilaVarishthaMahavidyalaya, Solapur on 'Literature: An Ocean of Research Opportunities'. All the sessions enriched the knowledge of participants and also encouraged them to take up research in the field of their choices. The information of various fields provided by the eminent speakershelped the participants know about the new areas of research and tools to be used.The speakers shared their knowledge and resolved the queries of the participants making the sessions interactive. The organizing committee included Dr. Qamar Talat, Professor, Govt. V.Y.T PG College, Ms. Sana Karale, Assistant Professor, Smt C.H.M College and Ms. Tanvi Joshi, Assistant Professor, V.G.Vaze College.The program convenors Dr.Suchitra Gupta, Professor, Govt. V.Y.T PG College and Dr. Kailas Aute, Assistant Professor,Smt.C.H.M Collegeextended the vote of thanks on day one and two respectively. Research Scholars Miss.Parul Pandey and Miss.VrushaliKaneri hosted the sessions on day one and two respectively.Program Convenor,Dr. Dinesh Kumar Nair, Associate Professor, V.G.Vaze College formally offered the closing lecture.as a part of the workshop the participants are required to submit two assignments by 30th August after which they would be given their certificates. The workshop ended up with a thought of collaborating for future programs for both teachers and students.

Principal
Govt. V.Y.T.P.G. Autonomous
College Durg (C.G.)

Education

अंग्रेजी विषय में शोध पर राष्ट्रीय कार्यशाला का आयोजन

deepak das • August 31, 2021

दुर्ग। शासकीय वीवायटी पीजी ऑटोनॉमस कालेज के अंग्रेजी भाषा विभाग द्वारा अंग्रेजी विषय में शोध विधि पर दो दिवसीय राष्ट्रीय कार्यशाला का आयोजन किया गया। सीएचएम कालेज उल्हासनगर, वीजी वझे कालेज ऑफ आर्ट्स, साइंस एंड कॉमर्स मुम्बई के साथ संयुक्त रूप से आयोजित यह कार्यशाला तीन महाविद्यालयों के समन्वय से आयोजित इस तरह की पहली कार्यशाला थी।कार्यशाला का उद्देश्य अंग्रेजी साहित्य में शोध की दिशा में शोधार्थियों का मार्गदर्शन करना था। कार्यशाला के पहले दिन शासकीय वीवायटी पीजी कालेज के प्राचार्य डॉ आरएन सिंह, वीजी वझे कालेज के प्राचार्य डॉ बीबी शर्मा एवं सीएचएम कालेज की प्राचार्य डॉ मंजू लालवानी ने अपना उद्बोधन दिया। अंग्रेजी विभाग की एसोसिएट प्रोफेसर डॉ सोमाली गुप्ता ने विषय प्रवेश कराया। प्रथम सत्र को संबोधित करते हुए आरके तलरेजा कालेज उल्हासनगर की एसोसिएट प्रोफेसर डॉ सुशीला पिल्लई ने समाजभाषा विज्ञान के सिद्धांतों एवं उपकरणों की जानकारी दी। द्वितीय सत्र को टाटा इंस्टीट्यूट ऑफ सोशल साइंस मुम्बई की डॉ अनुषा रामनाथन ने शोध के मिश्रित विधियों की जानकारी दी।

द्वितीय दिवस के प्रथम सत्र को साउथ इंडियन एडुकेशनल सोसायटी कालेज ऑफ आर्ट्स, साइंस एंड कॉमर्स मुम्बई की प्रोफेसर डॉ लक्ष्मी मुथुकुमार ने शोध के मिथकों पर प्रकाश डाला। दूसरे सत्र में एआर बिड़ला महिला वरिष्ठ महाविद्यालय शोलापुर की एसोसिएट प्रोफेसर डॉ एनी ज़ॉन ने साहित्य को शोध का अथाह सागर निरूपित किया।

आयोजन समिति में वीवायटी कालेज के प्रोफेसर डॉ कमर तलत, सीएचएम कालेज की सहा. प्राध्यापक सना कराले, वीजी वझे कालेज की तन्वी जोशी शामिल थीं। कार्यक्रम में वीवायटी कालेज की डॉ सुचित्रा गुप्ता, सीएचएम कालेज के डॉ कैलाश अयुते, शोधार्थी पारुल पाण्डे, वृशालु कनेरी का सराहनीय योगदान रहा।

कार्यक्रम संयोजक वीजी वझे कालेज के एसोसिएट प्रोफेसर डॉ दिनेश कुमार नायर ने समापन व्याख्यान दिया। प्रतिभागियों को दो असाइनमेंट सबमिट करने के बाद ही प्रमाणपत्र प्रदान किया जाएगा।

HSNC Board's Smt. Chandibai Himathmal Mansukhani College, Ulhasnagar, Maharashtra

Govt. V. Y. T. Post Graduate College Autonomous, Durg, Chhattisgarh

The KET's V. G. Vaze College of Arts, Science and Commerce Autonomous, Mumbai, Maharashtra

Departments of English
organise

Two-Day National Level Workshop
on

Research Methods in English Studies (Language and Literature)
(For UG and PG Students and Research Scholars)

25th and 26th August 2021

ABOUT THE WORKSHOP

Research is a systematic investigation of the materials in order to establish facts and find novel conclusions. Research in humanities helps in understanding the thought processes or perspectives of past generations, the unnoticed aspects of the society and applying it to the current life by finding similarities, understanding the problems faced by today's society and finding possible solutions. Research in literature and language helps to acquire knowledge from literary works and linguistic practices and enables one to apply it by testing theories and making observations. As literature is a vast subject, research cannot be confined to literary texts, but other avenues also need to be explored. Critical thinking, analytical reading, and interdisciplinary tools are generally linked with literary studies. Language studies entails experimental research, ELT techniques, methods of Sociolinguistics, Ethno-linguistics and Computational linguistics.

Literary research and language studies are at a crucial juncture, in the context of new research tools and interdisciplinary focus. Research methods in literature and language are redefined in the backdrop of digital technologies and the awareness of new primary sources and cultural texts. Literary and linguistic theories too have been undergoing a drastic change, bringing new perspectives on text, languages, and language studies.

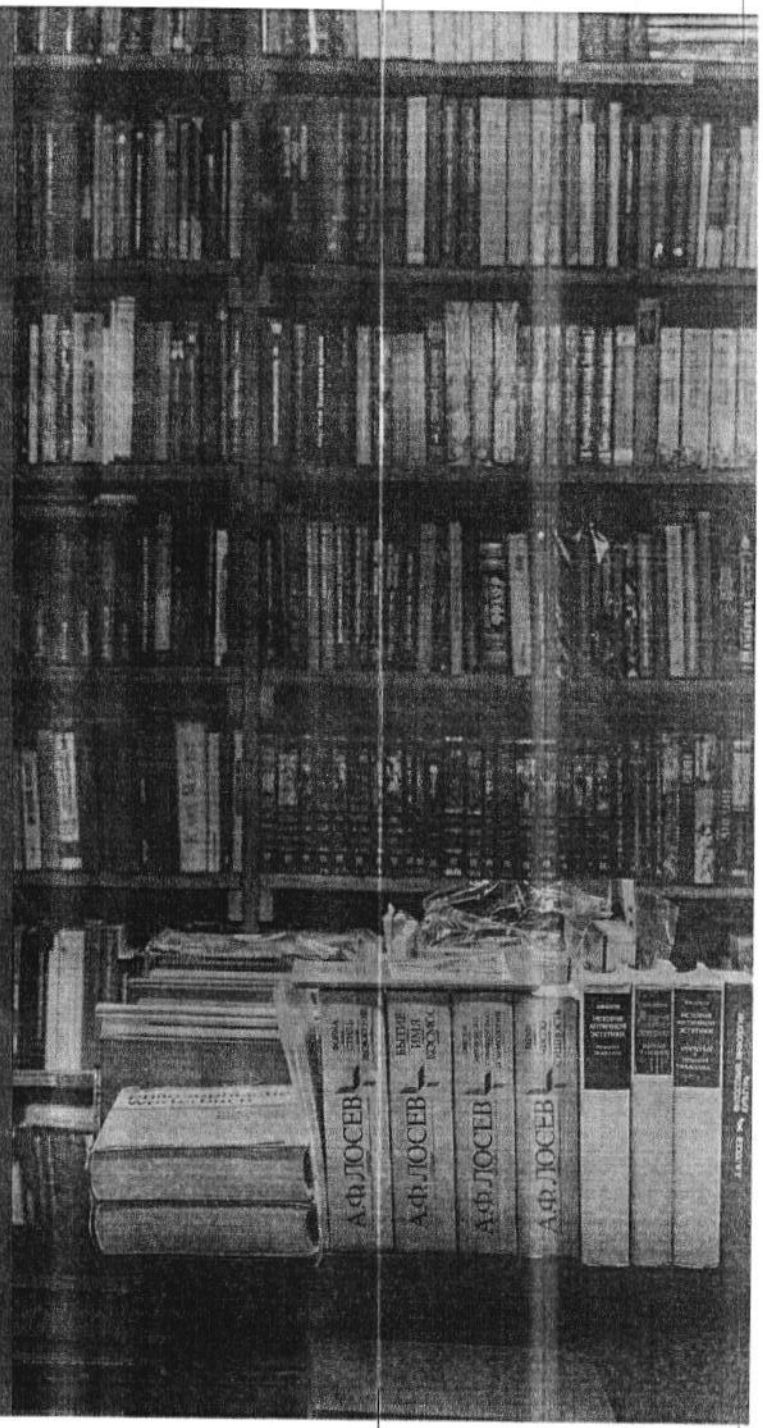
Documentation is also an important part in research; it provides attribution or credit to the original author or creator and helps in verifying the accuracy of the work. Citation is a proof of proper research being done as the sources from where information is obtained are listed. It also helps in avoiding plagiarism. This workshop marks an important milestone in addressing the fundamentals of language and literature research such as citation, methods, review of literature and so on and it provides hands-on training to the participants in arriving at research topics, framing titles, and writing abstracts for research papers and proposals. The workshop focuses on inculcating a healthy research culture among young scholars.

OBJECTIVES OF THE WORKSHOP

This workshop aims to introduce graduates, postgraduates, and research scholars to the fundamentals of research methods in English literature and language. The workshop will help introduce the basics of research in Humanities. The participants will be familiarized with various research methods and tools available. The workshop also aims at mapping new directions in literary and linguistic studies.

OUTCOME OF THE WORKSHOP

The participants will gain knowledge on the basics of research in humanities. They will acquire knowledge on various tools and methods of humanities research. They will be able to identify research topics, write abstracts and research papers and learn to add citations. They will also be familiarized with new tools and emerging areas in language and literature studies.



REGISTRATION

CLICK HERE TO REGISTER

Fees: INR 100/-

The workshop will bring together both UG and PG students from the three colleges wherein they will be trained by the experts in understanding fundamentals of research and its methods.

Participation: For UG, PG and Research Scholars

Note:

1 .Only selected participants will be a part of the workshop.

2. Participants will be given assignments on Day 1 and Day 2. Only those who complete the assignments, will be given the certificates.

PROGRAM SCHEDULE

DAY 1

PARTICULARS	TIME	RESOURCE PERSONS
Inauguration and Concept Note	02:00 pm to 02:30 pm	
Session - I	02:30 pm to 03:30 pm	**Dr. Sunila Pillai** Associate Professor R.K. Talreja College, Ulhasnagar
Session - II	03:30 pm to 04:30 pm	**Dr. Anusha Ramnathan** Assistant Professor Tata Institute of Social Sciences , Mumbai

DAY 2

PARTICULARS	TIME	RESOURCE PERSONS
Session - I	02:00 pm to 03:00 pm	**Dr. Lakshmi Muthukumar** Associate Professor Head, Dept. of English SIES College of Arts, Science and Commerce (Autonomous), Mumbai
Session - II	03:00 pm to 04:00 pm	**Prof. Dr. Annie John** Professor Head, Dept. of English A.R. Burla Mahila Varishtha Mahavidhyalya, Solapur

CHIEF PATRONS

Dr. Manju Lalwani Pathak
Principal
HNSC Board's Smt. CHM College

Prof. Dr. R. N. Singh
Principal
Govt. V.Y.T PG College
(Autonomous)

Dr. B. B. Sharma
Principal
KET's V. G. Vaze College
(Autonomous)

PROGRAM CONVENORS

Dr. Kailas Aute
Associate Professor,
Dept. of English
Smt. CHM College

Prof. Dr. Suchitra Gupta
Dept. of English
Govt. V.Y.T PG College
(Autonomous)

Dr. Dinesh Kumar Nair
Associate Professor,
Dean of Research,
Head, Dept. of English
KET's V. G. Vaze College
(Autonomous)

ORGANISING SECRETARIES

Ms. Sana Karale
Assistant Professor,
Dept. of English
Smt. CHM College

Prof. Dr. Qamar Talat
Professor,
Dept. of English,
Govt. V.Y.T PG College
(Autonomous)

Ms. Tanvi Joshi
Assistant Professor,
Dept. of English,
KET's V. G. Vaze College
(Autonomous)

COMMITTEE MEMBERS

HSNC BOARD'S
SMT. C.H.M. COLLEGE
ULHASNAGAR, MAHARASHTRA

Dr. Pratima Das
Associate Professor,
Head, Dept . of English
Vice Prinicipal

Dr. Deepa Mishra
Associate Professor,
Dept. of English

Mr. Ananda Pandhare
Assistant Professor,
Dept. of English

GOVT. V.Y.T. PG AUTONOMOUS COLLEGE
DURG, CHHATTISGARH

Prof. Dr. Mita Chakraborty
Head, Dept. of English

Prof. Dr. Somali Gupta
Dept. of English

Dr. Mercy George
Dept. of English

Dr. Meena Mann
Dept. of English

Dr. Tarlochan Kaur
Dept. of English

KET's V.G. VAZE COLLEGE OF ARTS, SCIENCE & COMMERCE (AUTONOMOUS)
MUMBAI, MAHARASHTRA

Prof. Dr. Preeta Nilesh
Vice Principal

Ms. Sundari Johnson
Assistant Professor,
Dept. of English

Ms. Ashwathi Anilkumar
Assistant Professor,
Dept. of Mass Media

HSNC BOARD'S
SMT. C.H.M. COLLEGE

ULHASNAGAR, MAHARASHTRA

Research Scholars

Ms. Sucheta Gandhi
Ms. Ashwathy R
Ms. Emelia Noronha
Ms. Vrushali Kaneri
Ms. Meenakshi Nandula
Ms. Saujanya. V
Ms. Pooja Pandey
Mr. Varun Jashnani

Student Coordinators

Ms. Merlin Mary Benny
Ms. Nisha Duseja
Ms. Chandni Verma
Ms. Rabia Kazi

GOVT. V.Y.T. PG AUTONOMOUS COLLEGE

DURG, CHHATTISGARH

Research Scholars

Ms. Shisirkana Bhattacharya
Ms. Parul Pandey
Mr. Mohammad Zafir Khan
Mr. Nitesh Garewal
Ms. Kusumita Sonwani
Ms. Monika Tolani
Ms. Samreen Siddiqui

Student Coordinators

Ms. Priyanka Verma
Mr. Devraj Bhaghel
Ms. Meha Sharma
Ms. Samriddhi Deshmukh
Mr. Bhupendra

KET's V. G. VAZE COLLEGE OF ARTS, SCIENCE & COMMERCE (AUTONOMOUS)

MUMBAI, MAHARASHTRA

Research Scholars

Ms. Nehal Thakkar
Ms. Geetha G.
Ms. Umangi Mehta
Mr. Udayan Chakraborty
Ms. Sundari Johnson
Ms. Tanvi Joshi
Mr. Pramod Bhosale
Ms. Jael Angel Johnson
Ms. Suwarna Suryawanshi
Ms. Madhumanti Dasgupta

Student Coordinators

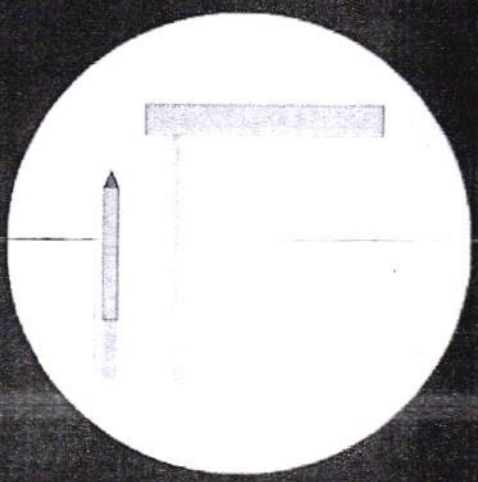
Ms. Riddhi Patankar
Ms. Devika Gadre
Ms. Snehal Gaikwad
Ms. Rose Tadvi
Ms. Vinaya Yendhe,
Ms. Alisha Shaikh,
Ms. Ketaki Pavagi,
Ms. Rachana Pisat

RESEARCH METHODS IN ENGLISH STUDIES (LANGUAGE AND LITERATURE)

DEBUNKING MYTHS, REALIZING RESEARCH

Dr. Lakshmi Muthukumar heads the Department of English, South Indian Education Society's College of Arts, Science and Commerce. She has been teaching for more than 25 years. Her areas of interest include Language studies, Gender Studies and Creative Writing. Her doctoral thesis focuses on "Negotiating the Private and the Public Spheres: A Feminist Exploration of the Gendered Spheres and Identity Struggles in the Plays of Wendy Wasserstein". Also she is a member of several syllabus design committees for Autonomous Colleges as well as Masters Programme in English Literature and Cultural Studies at University Mumbai. She has published over 30 research papers in various national and international journals of repute.

Dr. Lakshmi Muthukumar, Head, Department of English, South Indian Education Society's College of Arts, Science and Commerce, Mumbai.



DAY 2

DATE: 26th August 2021
TIME: 2:00 PM to 4:00 PM
PLATFORM: Zoom

RESEARCH METHODS IN ENGLISH STUDIES (LANGUAGE AND LITERATURE)

LITERATURE: AN OCEAN OF RESEARCH OPPORTUNITIES

Dr. Annie John heads the Department of English at A.R. Burla Mahila Varishtha Mahavidyalya, Solapur. She has been teaching undergraduate students for 26 years and the post graduate students for 20 years. Her area of expertise include analysis of diasporic tendencies in the immigrant writings of the writers of Indian diaspora. She is a registered guide for M. Phil and Ph.D in English, under Solapur University. She delivers talks regularly at National and International seminars. Dr. Annie is the Chairperson of the Board of Studies, member of the Academic Council, Chairperson of the Lapses Committee and also a member of the Students' Welfare and Cultural Committee. She has published several research papers at International and National levels and has authored several chapters in many books. Dr. Annie also holds several editorial positions.

Dr. Annie John,
Head, Department of English,
Associate Professor,
A.R.Burla Mahila Varishtha Mahavidyalya, Solapur.

DAY 2

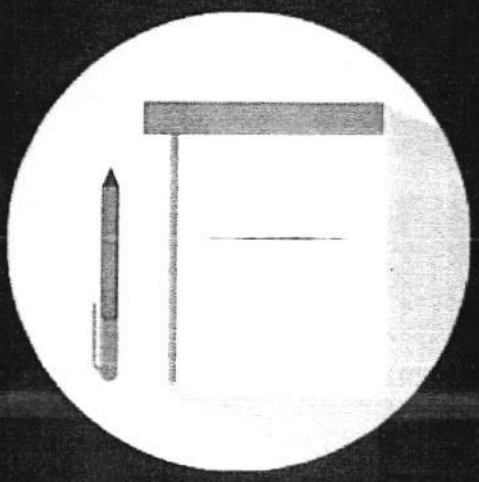
DATE: 26th August 2021
TIME: 2:00 PM to 4:00 PM
PLATFORM: Zoom

RESEARCH METHODS IN ENGLISH STUDIES (LANGUAGE AND LITERATURE)

MIXED METHODS RESEARCH: TOOLS AND STRATEGIES

Dr. Anusha Ramanathan is an Assistant Professor at CETE. She has teaching experience at both UG & PG level. She teaches courses on Assessment, Evaluation, instructional design, language education, literacy and mentoring and co-anchors blended and online TPD programmes at CEIAR, TISS. She has vast experience of developing edX based MOOC courses, content developer, curriculum consultant, editor, syllabus designer, teacher educator and faculty for language, literature, management and media studies. She develops Language for Reflective Teaching with ICT. Her areas of expertise include English Literature, Assessment & Evaluation, culture studies, ed-tech, ELT, Media studies, and teacher education.

Dr. Anusha Ramanathan
Consultant, Assistant Professor
Tata Institute of Social Sciences, Mumbai.



DAY 1

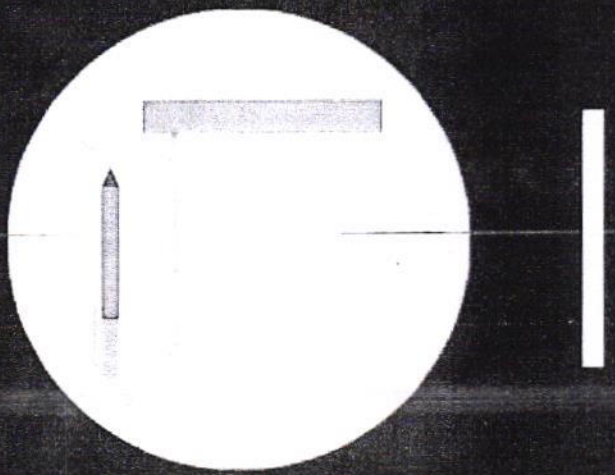
DATE: 25th August 2021
TIME: 2:00 PM to 4:30 PM
PLATFORM: Zoom

RESEARCH METHODS IN ENGLISH STUDIES (LANGUAGE AND LITERATURE)

TENETS AND TOOLS OF RESEARCH IN SOCIOLINGUISTICS

Dr. Sunila Pillai has been working as an Associate Professor at the R. K. Talreja College, Ulhasnagar for the last 22 years. She teaches both Post-graduate and Undergraduate students and is a Ph. D guide under the University of Mumbai. Her areas of expertise are American Literature, Language and Linguistics, Indian writing in English. She is the recipient of Fellowship under Faculty Improvement Programme of the UGC. She has co-authored 3 books for Institute of Distant and Open Learning of the University of Mumbai. She delivers talks and guidance lectures at various colleges and Universities. She has published several research articles in International and national journals of repute. She has been a member of several syllabus drafting and syllabus revision committees as well as Research advisory Committee. She is a paper setter and examiner for PG courses of the University of Mumbai.

Dr. Sunila Pillai,
Associate Professor,
R. K. Talreja College,
Ulhasnagar, Thane.



DAY 1

DATE: 25th August 2021
TIME: 2:00 PM to 4:30 PM
PLATFORM: Zoom

executed to determine the nature of traps responsible for dominant TL peaks of β and γ-irradiated limestone and quartz samples.

> J Fluoresc. 2020 Jul;30(4):819-825. doi: 10.1007/s10895-020-02536-9. Epub 2020 May 20.

Thermoluminescence Studies of β and γ-Irradiated Geological Materials for Environment Monitoring

Gu Cheng-Lin [1], Vikas Dubey [2], Kamal Kumar Kushwah [3], Manish Kumar Mishra [4], Ekta Pandey [5], Ratnesh Tiwari [6], Angesh Chandra [7], Neha Dubey [8]

Affiliations + expand

PMID: 32430863 DOI: 10.1007/s10895-020-02536-9

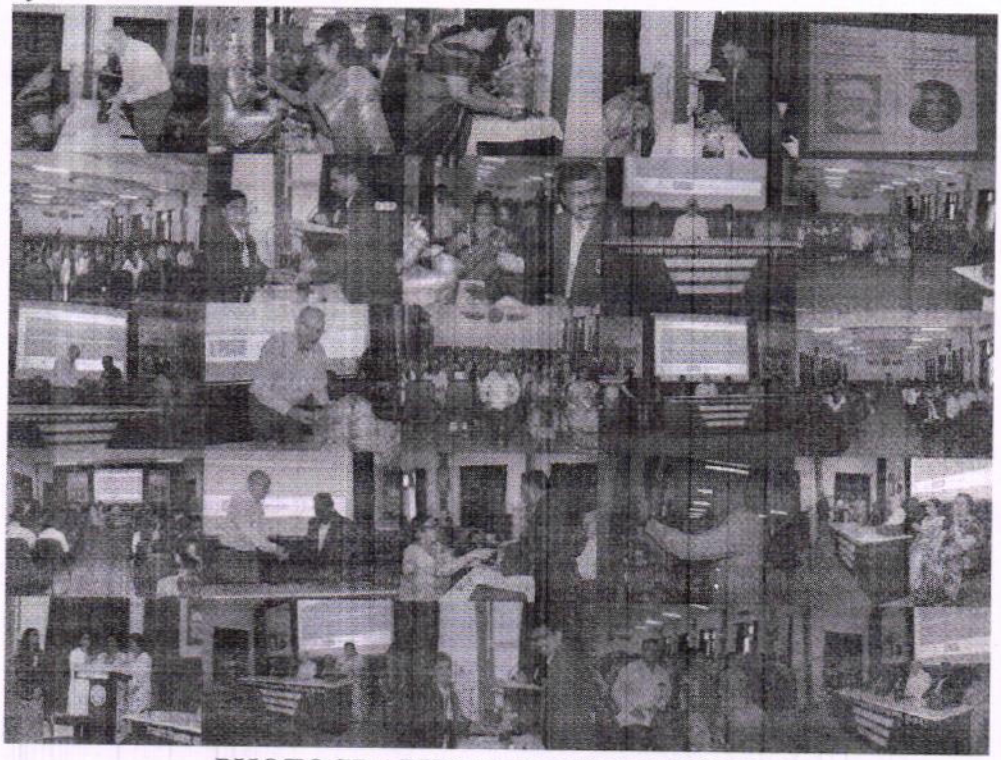
Abstract

In the present report, thermally stimulated luminescence (TSL) of quartz and limestone samples irradiated with β and γ-rays has been investigated. Herein the formation of trap depths and calculation of kinetic parameters of β and γ - irradiated quartz and limestone samples were studied through thermoluminescence (TL) glow curve analyses. The quartz and limestone samples were collected from various sites of Chhattisgarh (Patharia and Dalli-Rajhara mines). The collected raw samples were annealed at 400 °C. The phase formation of collected samples is confirmed by X-ray diffraction studies. The grain sizes of the samples are determined by using Debye-Scherrer formula. TL glow curves of the collected samples were recorded for various doses of β and γ-rays. Kinetic parameters such as order of kinetics frequency factor and trap depth were calculated by employing CGCD methods. A comparative study on the TL properties of the geological materials under β and γ-irradiation was done. The trap model analysis was executed to determine the nature of traps responsible for dominant TL peaks of β and γ-irradiated limestone and quartz samples.

Keywords: Limestone; Quartz; TL glow curve; β and γ - rays.

3. An international workshop on Novel Material was organized on 29-30 January 2020. Professor from Belgium Dr. Dirk Poelman explained high intensity phosphor by particles and explained its importance and uses. He also explained how to get high intensity light through presentation. He explained blue and white light emitting diodes, importance of phosphor material in economical white lights source and Mn Base Phosphor materials. BIT Raipur assistant professor Dr. Vikas Dubey explained the importance of luminescence materials in the field of medical and explained it importance in detail. He also explained his current research field and subject. He also told students that we should come out of our comfort zone and should think like quantum particles and should think how we can teach society the importance of research. Dr. M.D. Marta Professor from Poland University gave her lecture on Anodization and explained its importance. Professors and students asked several questions to her while giving answers she stated their differences between Indian education system and

Poland education system. She explained that in Poland has no policy like permanent employment. Every teacher gets employment according to their academy performance. Any degradation in the academic performance may cost their jobs, and because of that every teacher in Poland is conscious and responsible about the work. She also expressed her happiness towards the question asked by Indian students and professors of physics department. She had elaborate discussion on research project and education system and environment.

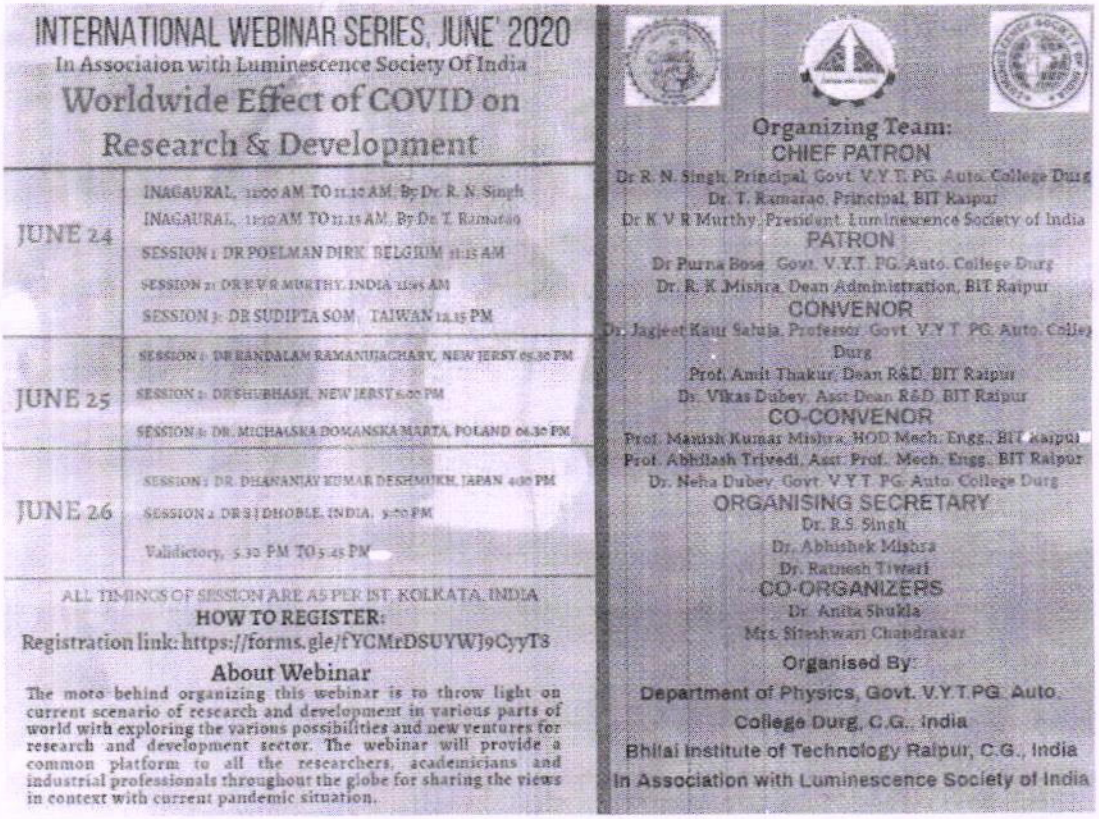


PHOTOGRAPHS DURING WORKSHOP

4. A three-day international webinar was organized by Government Viswanath Yadav Tamaskar Autonomous Postgraduate College Durg in collaboration with BIT Raipur and Luminescence Society of India on the topic "Effect of Corona on global level research and development" 24 June to 26 June 2020. Dr. Jagjeet Kaur Saluja, Convener, said that this webinar was attended by scientists from 6 countries as well as scientists and professors and researchers from 13 provinces of our India. These countries included scientists from countries such as Belgium, Taiwan, Poland,

America, Japan etc. Initially Dr. Jagjeet Kaur Saluja, the convener of this webinar, gave a welcome speech. Thereafter, Dr. T. Rama Rao, Principal of BIT Raipur, gave the inaugural speech. Thereafter, Dr. Poelman Durk, a full professor at the University of Ghent, Belgium, presented his lecture on the topic "Near Infrared Persistent Luminance for Medical Imaging". After Prof. Dirk's lecture, Prof. Dr. KVR Murthy of MS University, Baroda, while given a lecture on "The elimination of corona virus by 254 nanometer wavelength of ultraviolet light", highlighted the importance of physical distance at the time of Corona epidemic and at home Stayed advised to work. Prof. Dr. Sudipta Som of the National Taiwan University of Taipei presented his lecture on the topic "White-light LEDs". His life was presented by Dr. Neha Dubey, post-doctoral fellow and woman scientist of the college. Prof. Dr. Mikalska Domanska Marta, speaker of the University of the Military Technical University, presented his views on the topic "Introduction to Anode oxide, Morphology and Properties Influenced by Anodization Conditions and Their Applications". He was introduced by Dr. Mo. Khwaja Moinuddin, Professor of BIT Raipur and Dr. Poorna Bose, HOD.

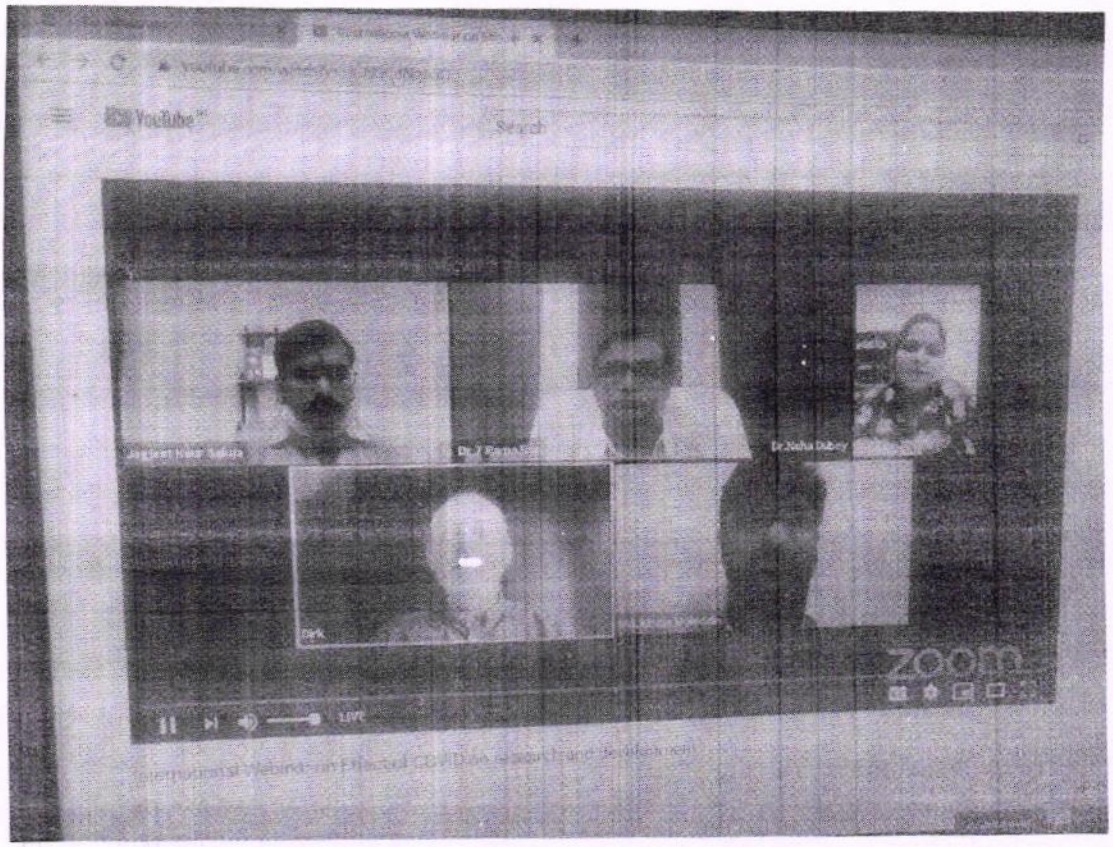
Department of Physics



Prof. Dr. Kandalam Ramanujachary from Rowan University, New Jersey, gave his lecture on the topic of "Drug Delivery". He was welcomed by Dr. KVR Murthy. Dr. Dhananjay Kumar Deshmukh, speaker of Chubhu University, Japan, gave his views on the topic "Covid-19 and its impact on R&D at global level". Dr. Shweta Tiwari gave his life introduction. Dr. SJ Dhoble, Professor, RTM University, Nagpur, presented his lecture on the topic "Phosphorus for Ink and Its Applications". At the end of the program, the Chief Patron of the webinar, Dr. T. Rama Rao and Convenor Dr. Jagjeet Kaur Saluja & Dr. Vikas Dubey presented the conclusion of this webinar. A vote of thanks was done by Dr. Neha Dubey. Total 170 participants were present in this webinar.

Department of Physics

Department of Physics



PHOTOGRAPHS DURING INTERNATIONAL WEBINAR

5. On 28 April 2021, a research paper entitled Composite nature of thermo luminescence studies in Dy3+ activated Sr2ZnSi2O7 phosphor was published in Optik journal. In this paper we reported the thermo-luminescent properties of Dy3+ activated Sr2ZnSi2O7 phosphors synthesized via solid-state reaction method. The synthesized phosphors were characterized via X-ray diffraction, transmission electron microscopy, Fourier transform infrared spectroscopy and thermoluminescent techniques. Thermoluminescence (TL) glow curve analysis of prepared Dy3+-activated Sr2ZnSi2O7 phosphors were recorded for different UV exposure time and found linear response with dose. The TL glow curve shows composite in nature and broad glow curve cantered at 309 ◦C were found. Composite TL glow curve extracted by glow fit program using computerized glow curve deconvolution (CGCD) technique and corresponding kinetic parameters are calculated. The obtained results indicate that the synthesized phosphors find potential applications in the fields of dosimetric applications.

Department of Physics

Optik - International Journal for Light and Electron Optics 241 (2021) 166904

Contents lists available at ScienceDirect

Optik

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

Original research article

Composite nature of thermo luminescence studies in Dy^{3+} activated $Sr_2ZnSi_2O_7$ phosphor

Siteshwari Chandraker [a], Jagjeet Kaur [a], Vikas Dubey [b,*], Neha Dubey [a]

[a] Department of Physics, Govt. V.Y.T. Post Graduate Autonomous College, Durg, Chhattisgarh 491001, India
[b] Department of Physics, Bhilai Institute of Technology Raipur, Chhattisgarh 493661, India

6. On 25 May 2021, a research paper entitled White light emission and thermoluminescence studies of Dy3+ activated Hardystonite (Ca2ZnSi2O7) phosphor was published in Luminescence journal. Here, we reported the photoluminescence and thermoluminescent properties of Dy-activated Ca2ZnSi2O7 phosphors synthesized using the solid-state method. The synthesized phosphors showed hardystonite type structure, and had micron-sized particles. Fourier transform infrared spectroscopy (FTIR) showed the existence of the functional groups and confirmed the formation of phosphor and photoluminescence techniques. The phosphors under excitation at 239 nm exhibited green-yellow emission spectra in the region 481–575 nm corresponding to the $4F_{9/2} \rightarrow 6H_{15/2}$ transitions of Dy3+ ions. The CIE coordinates were achieved to be (0.25, 0.27), which was narrowly close to the white region. Thermoluminescence (TL) glow curve analysis of prepared Dy3 +-activated Ca2ZnSi2O7 phosphors were recorded for different ultraviolet (UV) light exposure times and found to have a linear response with dose. The TL glow curves, recorded with various UV exposure times ranging from 5 to 25 min, showed a linear response with dosage. The corresponding kinetic parameters were also calculated using a computerized glow curve deconvolution (CGCD)

Department of Physics

technique. Activation energy was observed to enhance the increase in the peak temperature and its value was substantially higher for the third peak fitted using CGCD. The obtained results indicated that the synthesized pristine phosphors could be potentially used for lighting, displays, and dosimetric applications.

Received: 29 March 2021 | Revised: 24 May 2021 | Accepted: 25 May 2021
DOI: 10.1002/bio.4095

RESEARCH ARTICLE

LUMINESCENCE WILEY
The Journal of Biological and Chemical Luminescence

White light emission and thermoluminescence studies of Dy^{3+}-activated hardystonite ($Ca_2ZnSi_2O_7$) phosphor

Siteshwari Chandraker[1] | Jagjeet Kaur[1] | Ruby Priya[3] | Vikas Dubey[2] | Neha Dubey[1]

[1]Department of Physics, Govt. V.Y.T. Post Graduate Autonomous College Durg, Chhattisgarh, India
[2]Department of Physics, Bhilai Institute of Technology Raipur, Kendri, Raipur, India
[3]Department of Physics, University Institute of Sciences, Chandigarh University, Mohali, India

Correspondence
Vikas Dubey, Department of Physics, Bhilai Institute of Technology Raipur, C.G., 493661, India.

Abstract
Here, we report the photoluminescence and thermoluminescent properties of Dy-activated $Ca_2ZnSi_2O_7$ phosphors synthesized using the solid-state method. The synthesized phosphors showed hardystonite type structure, and had micron-sized particles. Fourier transform infrared spectroscopy (FTIR) showed the existence of the functional groups and confirmed the formation of phosphor and photoluminescence techniques. The phosphors under excitation at 239 nm exhibited green-yellow emission spectra in the region 481–575 nm corresponding to the $^4F_{9/2} \rightarrow {}^6H_{15/2}$ and

7. Prof Jagjeet Kaur Saluja has published an international book on PHOSPHORS FOR DISPLAY FORENSIC AND BIOMEDICAL APPLICATIONS Nova publisher New York in collaboration with Dr. Marta Michalska-Domańska Military University of Technology Warsaw, Poland & Dr. Vikas Dubey BIT RAIPUR in 2021.

Department of Physics

PHOSPHORS FOR DISPLAY, FORENSIC AND BIOMEDICAL APPLICATIONS

VIKAS DUBEY
MARTA MICHALSKA-DOMAŃSKA
NEHA DUBEY
AND
JAGJEET KAUR SALUJA
EDITORS

8. Three patents were also published, entitled A process for preparing calcium zirconate for UV LED devices for treating neonatal and skin diseases, A method for evaluating thermally stimulating luminescence behaviorEr3+, Yb3+ doped La2Zr2O7 phosphor for TL dosimeter, SOCIO ECONOMICAL SMART IOT BASED TRAFFIC MANAGEMENT SYSTEM by Australian Government in 2021.

Department of Physics

Australian Government

IP Australia

CERTIFICATE OF GRANT

INNOVATION PATENT

Patent number: 2021102599

The Commissioner of Patents has granted the above patent on 16 June 2021, and certifies that the below particulars have been registered in the Register of Patents.

Name and address of patentee(s):

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Shubhra Mishra of Professor Department of Physics, Shri Shankaracharya Institute of, Professional Management and Technology Raipur Chhattisgarh 492015 India

Vikas Dubey of Assistant Dean Research and Development, Bhilai Institute of Technology Raipur Chhattisgarh 493661 India

Neha Dubey of Principal Investigator WoS-A DST, Department of Physics, Govt. VYT PG Auto. College Durg Chhattisgarh 491001 India

Rakesh Singh Dhundhel of Associate Professor & Head, Department of Chemistry, Shri Shankaracharya Institute of Professional Management and Technology Raipur, Chhattisgarh 492015 India

J. P. Patra of Professor & Head, Department of Computer, Science and Engineering, Shri Shankaracharya

Australian Government

IP Australia

CERTIFICATE OF GRANT

INNOVATION PATENT

Patent number: 2021101673

The Commissioner of Patents has granted the above patent on 23 June 2021, and certifies that the below particulars have been registered in the Register of Patents.

Name and address of patentee(s):

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Jagjeet Kaur Saluja of Department of Physics, Govt. VYT PG Auto. College Durg Chhattisgarh 491001 India

N Kumar Swamy of Material Science Research Lab, School of, Science, ISBM University, Kosmi, (Nawapara) Block: Chhura Distt: Gariyaband Chhattisgarh 493996 India

Ram Krishna Deshmukh of Material Science Research Lab, School of Science, ISBM University, Kosmi (Nawapara) Block: Chhura Distt: Gariyaband Chhattisgarh 493996 India

Manish Kumar Mishra of Associate Professor & Head Department of, Mechanical Engineering, Bhilai Institute of Technology Raipur 493661 India

Vikas Dubey of Department of Physics, Bhilai Institute of Technology Raipur Chhattisgarh 493661 India

Om Prakash Verma of Lecturar (Physics) Govt., Higher Secondary School Piperchhedi Gariyaband India

Praveen Kumar Yadaw of Material Science Research Lab, School of Science, ISBM University, Kosmi (Nawapara) Block: Chhura Distt: Gariyaband Chhattisgarh 493996 India

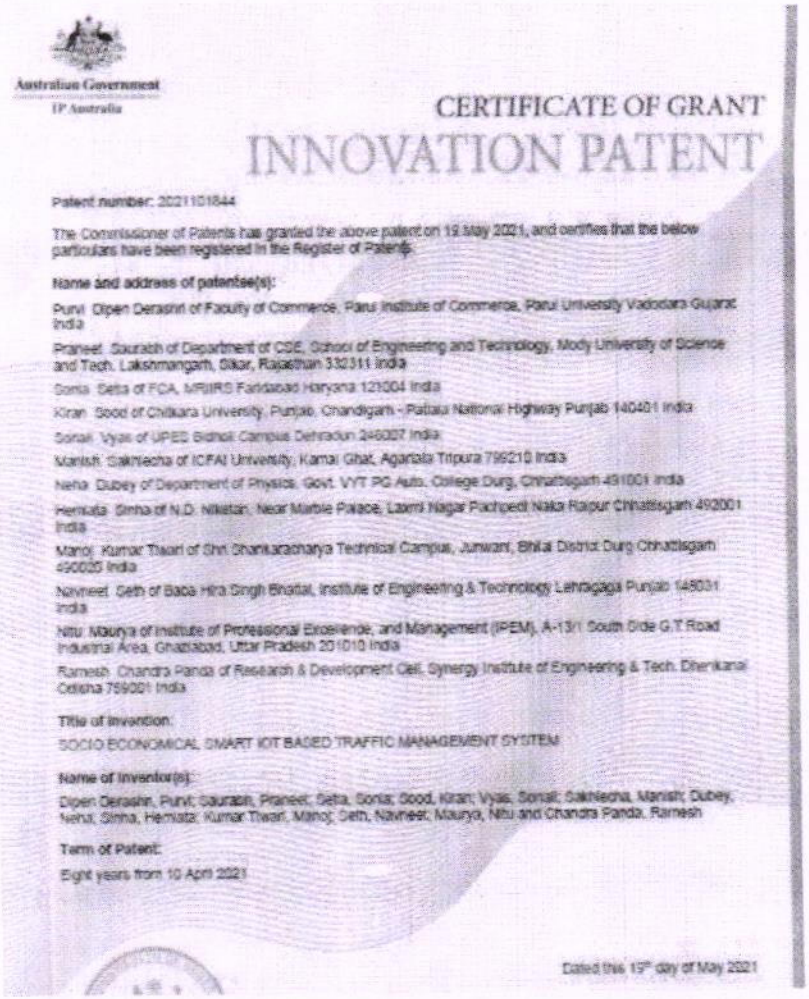
Title of invention:

A method for evaluating thermally stimulating luminescence behaviorEr3+, Yb3+ doped La2Zr2O7 phosphor for TL dosimeter

Name of inventor(s):

Dubey, Neha; Saluja, Jagjeet Kaur; Swamy, N. Kumar; Deshmukh, Ram Krishna; Mishra, Manish Kumar; Dubey, Vikas; Verma, Om Prakash and Yadaw, Praveen Kumar

Department of Physics



Australian Government
IP Australia

CERTIFICATE OF GRANT
INNOVATION PATENT

Patent number: 2021101844

The Commissioner of Patents has granted the above patent on 19 May 2021, and certifies that the below particulars have been registered in the Register of Patents.

Name and address of patentee(s):

Purvi Dipen Derashri of Faculty of Commerce, Parul Institute of Commerce, Parul University Vadodara Gujarat India

Praneet Saurabh of Department of CSE, School of Engineering and Technology, Mody University of Science and Tech. Lakshmangarh, Sikar, Rajasthan 332311 India

Sonia Setia of FCA, MRIIRS Faridabad Haryana 121004 India

Kiran Sood of Chitkara University, Punjab, Chandigarh - Patiala National Highway Punjab 140401 India

Sonali Vyas of UPES Bidholi Campus Dehradun 248007 India

Manish Sakhlecha of ICFAI University, Kamal Ghat, Agartala Tripura 799210 India

Neha Dubey of Department of Physics, Govt. VYT PG Auto. College Durg, Chhattisgarh 491001 India

Hemlata Sinha of N.D. Niketan, Near Marble Palace, Laxmi Nagar Pachpedi Naka Raipur Chhattisgarh 492001 India

Manoj Kumar Tiwari of Shri Shankaracharya Technical Campus, Junwani, Bhilai District Durg Chhattisgarh 490020 India

Navneet Seth of Baba Hira Singh Bhattal, Institute of Engineering & Technology Lehragaga Punjab 148031 India

Nitu Maurya of Institute of Professional Excellence, and Management (IPEM), A-13/1 South Side G.T Road Industrial Area, Ghaziabad, Uttar Pradesh 201010 India

Ramesh Chandra Panda of Research & Development Cell, Synergy Institute of Engineering & Tech. Dhenkanal Odisha 759001 India

Title of invention:

SOCIO ECONOMICAL SMART IOT BASED TRAFFIC MANAGEMENT SYSTEM

Name of inventor(s):

Dipen Derashri; Purvi; Saurabh, Praneet; Setia, Sonia; Sood, Kiran; Vyas, Sonali; Sakhlecha, Manish; Dubey, Neha; Sinha, Hemlata; Kumar Tiwari, Manoj; Seth, Navneet; Maurya, Nitu and Chandra Panda, Ramesh

Term of Patent:

Eight years from 10 April 2021

Dated this 19th day of May 2021

Department of Physics

25	Improvement in response and molecular alignment of liquid crystal with suspension of ferric oxide nanoparticles	LPU, JNPG COLLEGE LUCKNOW, BHU, J. S. S. Academy of Technical Education, Uttarahalli, Kengeri, Bangalore	2019-20	RESEARCH PAPER PUBLISHED	Material Research Express	1.618
26	Synthesis and characterization of PEDOT:PSS/ZnOnanowires hetrojunction on ITO coated plastic substrate for llight-emitting diodes	Udai Pratap Autonomous PG College Varanasi,UP,	2019-20	RESEARCH PAPER PUBLISHED	Materials Today : Proceedings 15, 3, 2019, 394-399	1.8
27	Electrical Conductivity of Cholesteric Esters and Their Homogeneous Mixtures	JNPG COLLEGE LUCKNOW & UNIVERSITY OF LUCKNOW UP	2019-20	RESEARCH PAPER PUBLISHED	Sri Jnpg College Revelation: A Journal Of Popular Science	
28	Synthesis of Ag Nanoparticle-Decorated ZnO Nanorods Adopting the Low-Temperature Hydrothermal Method	Dr. Harisingh Gour Central University, Sagar, MP	2019-20	RESEARCH PAPER PUBLISHED	Journal of Electronic Materials	1.771
29	An Experimental Analysis of Feature Based Blind Steganalysis Techniques	SSTC, Bhilai & NIT RAIPUR	2018-19	RESEARCH PAPER PUBLISHED	International Journal of Innovative Technology and Exploring Engineering	0.102
30	Spectroscopic, dielectric and nonlinear current–voltage characterization of a hydrogen-bonded liquid crystalline compound influenced via graphitic nanoflakes: An equilibrium between the experimental and theoretical studies	Babasaheb Bhimrao Ambedkar University, Rae Bareli Road, Lucknow	2020-21	RESEARCH PAPER PUBLISHED	Journal Of Molecular Liquids	6.165

31	Silver nanoparticles dispersed in nematic liquid crystal: an impact on dielectric and electro-optical parameters	JNPG COLLEGE LUCKNOW & UNIVERSITY OF LUCKNOW	2019-20	RESEARCH PAPER PUBLISHED	Journal Of Theoretical And Applied Physics	1.175
32	Exploration of Thermoluminescence and Photoluminescence Properties of Eu3+ Doped La2Zr2O7 Phosphors	BIT RAIPUR	2020-21	RESEARCH PAPER PUBLISHED	Analytical Chemistry Letters	1.467
33	Thermoluminescence glow curve analysis and trap parameters calculation of UV-induced La 2 Zr 2 O 7 phosphor doped with gadolin um	BIT RAIPUR, Science and Humanities, Faculty of Engineering, Christ (Deemed to University), Bangalore	2020-21	RESEARCH PAPER PUBLISHED	Journal Of Materials Science: Materials In Elec tronics	2.38
34	Influence of SiO2 nanoparticles on the dielectric properties and anchoring energy parameters of pure ferroelectric liquid crystal	JNPG COLLEGE LUCKNOW, LPU & UNIVERSITY OF LUCKNOW	2019-20	RESEARCH PAPER PUBLISHED	Journal Of Dispersion Science And Technology	1.701
35	Thermoluminescence Studies of β and γ-Irradiated Geological Materials for Environment Monitoring	Jabalpur Engineering College Jabalpur, Jabalpur& BIT RAIPUR	2019-20	RESEARCH PAPER PUBLISHED	Journal of Fluorescence	2.093
36	White light emission and thermoluminescence studies of Dy3+ activated Hardystonite (Ca2ZnSi2O7) phosphor	BIT RAIPUR	2020-21	RESEARCH PAPER PUBLISHED	Luminescence (WILEY)	2.464
37	Composite nature of thermo luminescence studies in Dy3+ activated Sr2ZnSi2O7 phosphor	BIT RAIPUR	2020-21	RESEARCH PAPER PUBLISHED	Optik	2.187
38	Dielectric and electro-optical properties of ferric oxide nanoparticles doped 4-octyloxy-	JNPG COLLEGE LUCKNOW, LPU , UNIVERSITY OF LUCKNOW & IIT ROORKEE	2020-21	RESEARCH PAPER PUBLISHED	Liquid Crystals	2.908

	4'cyanobiphenyl liquid crystal-based nanocomposites for advanced display systems					
39	Disturbances in solar wind plasma flow and field disrurbances during the period of 2012-2020	Govt. Vivekanand P. G. College, Maihar Satna M. P APS University Rewa M.P	2020-21	RESEARCH PAPER PUBLISHED	EUROPEAN ACDEMIC RESEARCH	
40	Higher Order Statistics Based Blind Steg analysis using Deep Learning	PTRSU, Raipur Disha College, Raipur SAP Labs Pvt. Ltd, Banglore , GEC, Jagdalpur	2020-21	RESEARCH PAPER PUBLISHED	Journal of Ravishankar University (PART-B)	
41	FITNESS INTELLIGENT PREDICTIVE ANALYTICS USING DEEP LEARNING	SSTC, Bhilai	18-02-2020	PATENT PUBLISHED		
42	A DWT FEATURE BASED BLIND STEGANALYSIS IN TRANSFORM DOMAIN	SSTC, Bhilai	30-11-18	COPYRIGHT PUBLISHED		
43	A GABOR FILTER BASED BLIND STEGANALYSIS FOR JPEG IMAGES	SSTC, Bhilai	21-05-19	COPYRIGHT PUBLISHED		

	crystalline compound influenced via graphitic nanoflakes: An equilibrium between the experimental and theoretical studies	Unité de Dynamique et Structure des Matériaux Moléculaires (UDSMM), Université du Littoral Côte d'Opale, 59140 Dunkerque, France				
7	Thermoluminescence Studies of β and γ-Irradiated Geological Materials for Environment Monitoring	Gu Cheng-Lin Faculty of Science, Jiamusi University, Jiamusi, 154007, China	2020-21	RESEARCH PAPER PUBLISHED	Journal of Fluorescence	2.093
8	PHOSPHORS FOR DISPLAY FORENSIC AND BIOMEDICAL APPLICATIONS Nova publisher New York	Dr. Marta Michalska-Domańska Military University of Technology Warsaw, Poland	2020-21	INTERNATIONAL BOOK PUBLISHED	NOVA PUBLISHER NEW YORK	
9.	INTERNATIONAL WEBINAR on Corona's impact on research and development at the global level	BIT RAIPUR	2019-20	INTERNATIONAL WEBINAR		
10	INTERNATIONAL Workshop	BIT RAIPUR	2019-20	INTERNATIONAL WORKSHOP		
11	Phosphors in Role of Magnetic Resonance, Medical Imaging and Drug Delivery Applications: A Review	Dr. K V R MURTHY MS UNIVERSITY BARODA	2020	INTERNATIONAL BOOK PUBLISHED Luminescent Materials in Display and Biomedical Applications	CRC PRESS	
12	Effect of CaZrO3 Doping by Gd3+ on Phototherapy Lamp Phosphor Performance	Dr. Marta Michalska-Domańska Military University	2020	INTERNATIONAL BOOK PUBLISHED	CRC PRESS	

		of Technology Warsaw, Poland		Luminescent Materials in Display and Biomedical Applications		
13	Spectroscopic Parameters via Judd–Ofelt Analysis of Eu3+ Doped La2Zr2O7 Phosphor,	V Dubey, MK Mishra	2019	BOOK PUBLISHED	International Conference on Intelligent Computing and Smart Communication , 2020, Springer	
14	Spectroscopic parameters of red emitting Eu3+ doped La2Ba3B4O12 phosphor for display and forensic applications	Dr. Marta Michalska-Domańska Military University of Technology Warsaw, Poland	2021	BOOK PUBLISHED	Hybrid Perovskite Composite Materials	
15	Enhancement of photoluminescence / phosphorescence properties of Eu3+ doped Gd2Zr2O7 phosphor	Dr. Marta Michalska-Domańska Military University of Technology Warsaw, Poland	2021	BOOK PUBLISHED	Hybrid Perovskite Composite Materials	
16	PATENTS	A process for preparing calcium zirconate for UV LED devices for treating neonatal and skin diseases	2020-21	PATENT PUBLISHED	AUSTRALIA	
17	PATENTS	A method for evaluating thermally stimulating luminescence behaviorEr3+, Yb3+ doped La2Zr2O7 phosphor for TL dosimeter	2020-21	PATENT PUBLISHED	AUSTRALIA	

18	PATENTS	SOCIO ECONOMICAL SMART IOT BASED TRAFFIC MANAGEMENT SYSTEM	2020-21	PATENT PUBLISHED	AUSTRALIA	

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