

Abstract Book

2nd INTERNATIONAL CONFERENCE

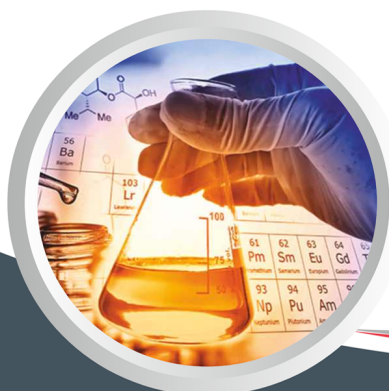
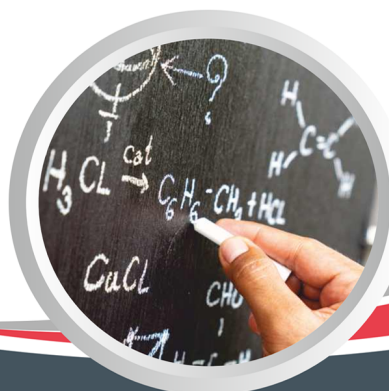
ON

**RECENT ADVANCES IN MATERIAL SCIENCE
AND NANOTECHNOLOGY**

SOUVENIR

**RAMAN
2022**

12th - 14th May 2022



Organized by

Department of Physics

G. S. Tompe Arts, Commerce & Science College,

Chandur Bazar

In Collaboration with

I.Q.A.C.,

Sant Gadge Baba Amravati University, Amravati. (M. S.)

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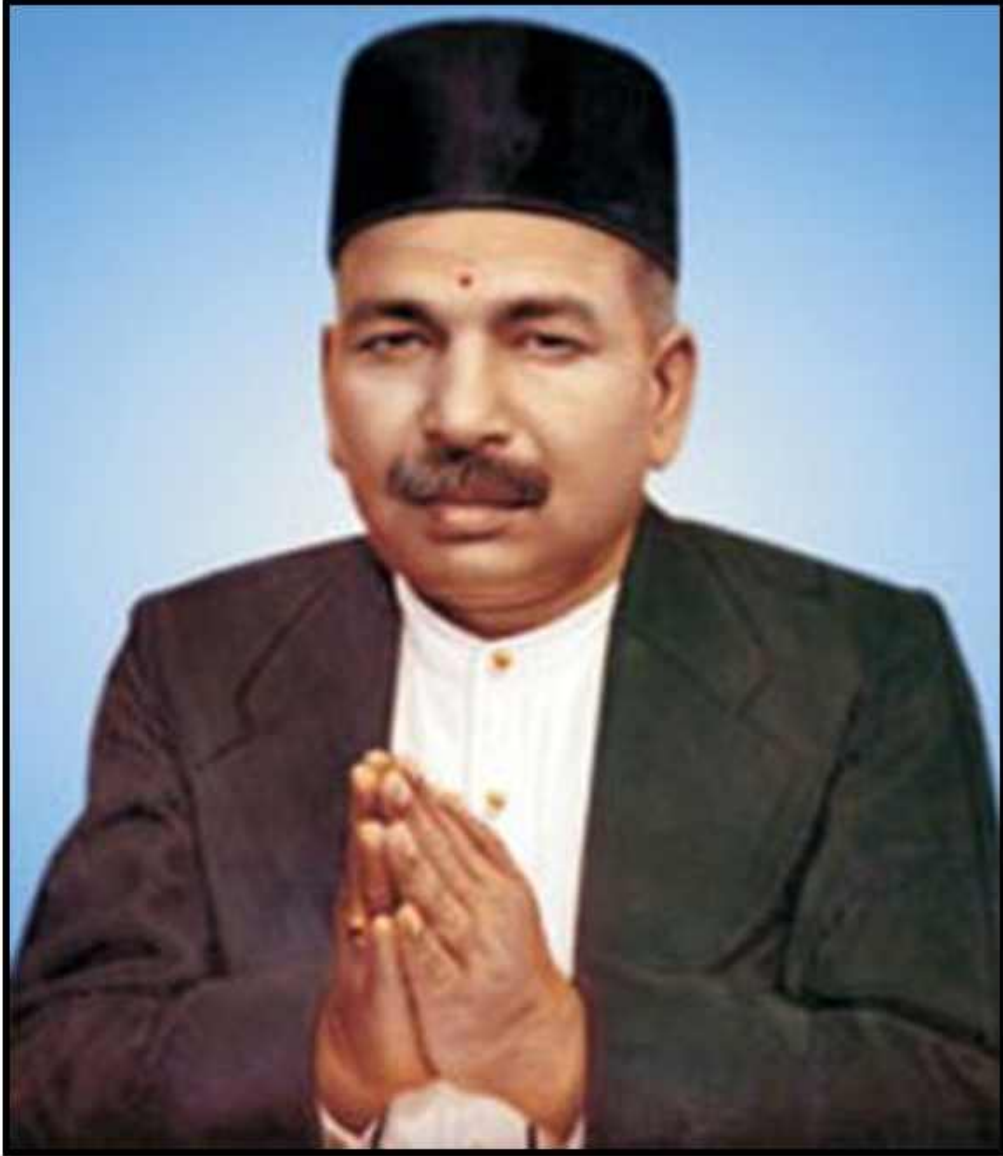
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OUR INSPIRATION



Late. Shri. Govindrao Sitaramji Tompe

Founder

G.S. Tompe Mahavidyalaya, Chandur Bazar

2ND INTERNATIONAL CONFERENCE

**RECENT ADVANCES IN MATERIAL SCIENCE
AND NANOTECHNOLOGY**

RAMAN 2022

Organized by
Department of Physics
G. S. Tompe Arts, Commerce & Science College, Chandur Bazar
In Collaboration with
I.Q.A.C.,
Sant Gadge baba Amravati University

● Editors ●

Dr. P. S. Deole
Dr. D. R. Bijwe
Prof. M. N. Pawar
Dr. A. V. Rajgure

● Publisher ●

Dr. R. S. Ramteke

Principal

G. S. Tompe Arts, Commerce
& Science College,
Chandur Bazar, Dist.- Amravati (M. S.)

● Date of Publication : 12th May 2022 ●

About the College

G. S. Tompe Arts, Commerce and Science College, is one of the oldest colleges of the Amravati district having completed its 50th years in 2018. The college was established in 1968 by Late Govindraoji Sitaramji Tompe, a renowned philanthropist of his time. His schooling cannot be traced out and perhaps this might be the reason which grieved him too much and consequently motivated him to provide the higher education to the students of adjacent area, the education which he himself could not get and remained thirsty all through his life and kept on yearning in desire to gain it.

Nevertheless, the vision that he possessed cannot tag him as an illiterate person, rather he may be called an unschooled person having great vision and mission of life.

G. S. Tompe Arts, Commerce and Science College is located in Chandur Bazar which is a taluka place surrounded by the rural area. The tribal area called 'Melghat', known for its 'Tiger Reserve Project' is near from it. The college is affiliated to Sant Gadge Baba Amravati University, Amravati. The College is on the forefront of the town and Amravati-Chandur Bazar highway passes right from its main gate. Its taluka place in Amravati district. It deserves special mention that the area is known for the orchards of Orange.

The college falls in the category of co-education (grant-in-aid) and every year in an average 2000 students are admitted for various academic pursuits. As far senior section of the college is concerned, almost 1800 students are accommodated in the various streams and programmes offered by the college. To carry out all the functioning of the college, almost 100 teaching and non-teaching staff has been striving tirelessly since its establishment and the college has been continuously trying to ascend its progress graph having no feeling of satiety.

Conference Structure

Conference will have key note speaker, Plenary talks, Invited talks and Oral Presentations. Hardcopy of the certificate will be posted on the institutional registered address of the participants

Background Recent Advances in Material Science and Nanotechnology has borne fruit in bringing together young and dynamic researchers, academicians and industrialists to explore ,their knowledge and novel ideas to improve the concepts in this vital multidisciplinary area of research for economic growth and sustainable development of the society. 'RAMAN-2022' is timely need to produce many need-based products in different industrial sectors.

The conference aims to provide open discussion forum through e-platform and bringing together academicians, young scientists, researchers and technologists to meet the global demand of novel materials and challenges in the field of Material Science and Nanotechnology. Outstanding Academic Excellence Award Applications are invited for 'Outstanding Academic Excellence Award' along with the following documents Photocopy of PhD degree obtained Teaching and research experience Publication details (Papers, Books, etc) Awards at National/International level Talk delivered/Chaired session in National/International conferences PhD awarded under supervision

Conference Topics

- * Nanomaterials and Application
- * Nanoscience and Nanotechnology
- * Material Science
- * Ultrasonic and Acoustics Liquid Dielectric
- * Thin Film and Polymers
- * Semiconductor Materials and Devices
- * Ceramic Advanced Smart Materials
- * Chemical Materials and its Characterization
- * Bio-materials and Biosensors
- * Cosmetic Materials
- * Ultrasonic Transducer Materials
- * Non-destructive Testing and Evaluation
- * Nanobiophysics
- * Mathematical Physics
- * Green Chemistry

RAMAN 2022

2ND INTERNATIONAL CONFERENCE

RECENT ADVANCES IN MATERIAL SCIENCE
AND NANOTECHNOLOGY

RAMAN 2022

Organized by
Department of Physics
G. S. Tompe Arts, Commerce & Science College, Chandur Bazar
In Collaboration with
I.Q.A.C.,
Sant Gadge baba Amravati University

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Chairman, G. S. Tompe Mahavidyalaya
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Principal
G. S. Tompe Mahavidyalaya

• Chairman •



Prof. Dr. S. A. Waghuley
Director, IQAC SGBAU, Amravati

• Convener •



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Dept. of Physics
Dr. Ambedkar College Nagpur



Dr. U. P. Manik
Dept. of Physics
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Chandrapur



MESSAGE

Hon'ble Bhaskardada Tompe

Secretary,

G. S. Tompe Mahavidyalaya Sarvajanik Trust's,
Chandur Bazar

It gives me great pleasure that the Department of Physics of our College is organizing a DST-SERB sponsored three days 2nd International Conference on "Recent Advances in Material Science and Nanotechnology" during May 12-14, 2022 in collaboration with I.Q.A.C., Sant Gadge Baba Amravati University, Amravati.

I am sure that this international conference will share latest path breaking developments in the field from eminent scientist to new researchers and promote research regarding advanced technologies in material science.

I take this opportunity to appreciate the efforts of organizers and in particular congratulate the faculty members of Physics Department for organizing such an important conference.

I wish a grand success to this International conference.

Mr. Bhaskardada Tompe

Secretary

G. S. Tompe Mahavidyalaya Sarvajanik Trusts
Chandur Bazar

PROF. DR. DILEEP N. MALKHEDE

M.E., Ph.D.

VICE-CHANCELLOR



SANT GADGE BABA
AMRAVATI UNIVERSITY
AMRAVATI - 444 602
MAHARASHTRA (INDIA)



MESSAGE

I am delighted to know that, G. S. Tompe Arts, Commerce & Science College, Chandur Bazar and I.Q.A.C., Sant Gadge Baba Amravati University, Amravati is jointly organizing "2nd International Conference on "Recent Advances in Material Science and Nanotechnology (RAMAN – 2022)" on 12th to 14th May, 2022.

As the conglomeration of eminent personalities like Sr. Research Scientists & Academicians would deliberate on various important themes of the Conference I believe, it will help to enhance recent trends in science & nanotechnology. This conference will also strengthen capabilities of all the participants and promote them towards the future advancement of research.

I extend my warm greetings to the Principal, editorial board and student contributors to keep the good work. I wish them all a magnificent success.

(Dr. Dileep Malkhede)

Dr. Rajendra Ramteke
Principal,
G. S. Tompe Arts, Commerce &
Science College,
Chandur Bazar, Distt. Amravati

MESSAGE



It gives me an immense pleasure to know that G. S. Tompe Arts, Commerce & Science College is going to organize an International Conference on "Recent Advances in Material Science and Nanotechnology (RAMAN-2022)" during May 12-14, 2022.

Nanotechnology and its microscopic universe do offer enormous possibilities for contemporary science and industry. Nanotechnology and nanomaterials can be applied in all kinds of industrial sectors. They are usually found in these areas including but not limited to electronics, energy, biomedicine, environment, food, textile, etc. However, the environmental, health and safety risks of nanotechnology and concerns related to its commercialisation should be addressed scrupulously and properly.

I do believe that this conference will be able to provide an excellent opportunity to the researchers related with the subject with a view to congregate at one place and exchange their outcome of research and expertise, as envisaged by the organizers of the conference.

I congratulate the college on this occasion and wish the organizers a grand success with the hope that their endeavour will definitely help address the challenging issues in contemporary material sciences nanotechnology, so that new benchmarks would be established in near future.

Dr. S. V. Dudul,

I/C Dean,

Faculty of Science and Technology,

Sant Gadge Baba Amravati University,

Amravati



MESSAGE

It gives me immense pleasure to know that Department of Physics of G.S. Tompe Arts, Commerce & Science College of Chandur bazar in collaboration with I.Q.A.C. of Sant Gadge Baba Amravati University, Amravati. is organizing 02nd International conference on Recent Advances in Material Science and Nanotechnology from 12th May 2022 to 14th May 2022.

It is also a matter of pride that a souvenir is being released on this notable occasion. This conference will witness Researchers, academicians and eminent experts working in different field of material science and nanotechnology. A collaborative link between likeminded people across the globe will encourage acquiring novel knowledge in the field of nanotechnology. I am very confident that this conference will prove to be prolific and will substantiate the chosen topics.

It is certainly commendable effort of G.S. Tompe College to organize such a conference on such an extensive scale with experts and participants across the globe.

I extend my best wishes for the success of the conference and for publication of the souvenir.

Dr. S.S.Yawale

Director
Pre-IAS Training Centre, Amravati.

प्रो० देवराज सिंह

निदेशक

प्रो०राजेन्द्र सिंह (रज्जू भइया) भौतिकीय विज्ञान

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Prof. Devraj Singh

Director

Prof. Rajendra Singh (RajjuBhaiya) Institute
of Physical Sciences for Study and Research



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02 MAY 2022

Message

I feel happy to know that G.S. Tompe Arts, Commerce & Science College, Chandur Bazar is organizing "Second International Conference on Recent Advances in Materials Science & Nanotechnology (RAMAN-2022)" in association with IQAC Cell, Sant Gadge Baba Amravati University during 12th-14th May, 2022. To mark the occasion a souvenir is also being released.

The conference will witness the participation from research scholar, professors and scientists working in different fields of materials science & nanotechnology. A common platform will encourage gaining the new insight in the field of materials science & nanotechnology.

I strongly believe that the conference will result in actual output in the support of its topics.

I hope that the entire participants will enjoy this academic fest.

I wish all the success for the conference.

Devraj Singh

02/05/2022

(Prof. Devraj Singh)

Prof. (Dr.) Devraj Singh

Professor & Head, Department of Physics,

Director, Prof. Rajendra Singh (Rajju Bhaiya)

Institute of Physical Sciences for Study & Research,

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(Ministry of Human Resource Development, Govt. of India)

Nelson Mandela Marg, Vasant Kunj, New Delhi-110070

28-04-2022

Greetings,

I am delighted to express my BEST WISHES to the organizing team of 2nd International Conference on Recent Advances in Material Science and Nanotechnology. May this conference be characterized by fruitful scientific discussions and lead to the betterment of society. I'm sure that your conference will be a great success considering the effort organizing team putting in this event in quality and diversity in the speakers.

My best wishes are to the Convenor, the staff, and everyone else connected with 2nd International Conference on Recent Advances in Material Science and Nanotechnology for a successful "RAMAN 2022".

S.K.K.
28/04/22
Dr. Shrishail Kamble



From the Principal's Desk



It is a moment of pride for me to host this International conference. I warmly welcome to all the dignitaries, scientist, delegates and students participating in three days 2nd International conference on "Recent Advances in Material Science and Nanotechnology" hosted by the college. The college established in the year 1967-68 is affiliated to Sant Gadge Baba Amravati University, Amravati and accredited by NAAC with B+ grade. The college offers Arts, Commerce & Science with B. Sc., M. Sc., B. A., M. A., B. Com., M. Com. and recently started three years degree course in B. Voc.

The event is focused on the Recent Advances in Material Science and Nanotechnology. The conference aims to provide common platform for researcher, academicians etc for the exchange of ideas , experience relevant to the various themes. I am sure that the themes and contents of the event will be beneficial for the society.

Finally I would like to express our sincere gratitude towards G. S. Tompe Mahavidyalaya Sarvajanic Trusts, Department of Science and Technology, New Delhi, Sant Gadge Baba Amravati University, Amravati and the sponsors who have whole heartedly extended their kind support for the successful organization of the conference.

I am very glad that the Department of Physics has taken the much needed initiatives of organizing the conference of this stature and I wish them all success in their tireless endeavor.

Dr. R. S. Ramteke

Chairman, RAMAN-2022

Principal

G. S. Tompe Arts, Commerce & Science College,
Chandur Bazar

From the desk of Chairman RAMAN-2022



On behalf of the Organizing Committee, it is a great pleasure for me to welcome all the Eminent Scientist and Researchers, Academicians, Patrons, Principals and Advisers to "Second International Conference on Recent Advances in Material Science and Nanotechnology" (RAMAN-2022). The RAMAN Conference series is held in various places of India and this time G.S. Tompe Arts, Commerce and Science College, Chandur Bazar has the honor to organize this prestigious event.

The aim of the Conference is to provide a forum for delegates from the industry, research labs and academia to exchange ideas and presenting their research works. In addition, it is an ideal venue for interactions and for them to establish the all-important contacts with each other.

This is a momentous and remarkable occasion in moulding our thoughts towards the applications of Physics/Materials Science to the society with innovative materials and nano-devices. The Key-note lectures, Plenary talks, Invited talks and Paper presentations of stalwarts will open up a new vista of knowledge before blooming researchers and scientists.

The staff of Sant Gadge Baba Amravati University has indeed contributed its' mite towards ensuring its success. I am also grateful to the Department of Physics, G.S. Tompe Arts, Commerce & Science College, Chandur Bazar and Sponsors for their collaboration and liberal support.

I am extremely grateful to Hon'ble Vice Chancellor Prof. (Dr.) Dileep N. Malkhede and other authorities whose enthusiasm and excellent support has given us great strength and encouragement for this important international event.

Finally, I would like to thank everybody involved in the organization of this event. I wish all the participants a very successful Conference with fruitful discussions and a memorable stay during the conference.

Looking forward to the international conference and welcoming you all once again.

Best wishes.



Prof. (Dr.) Sandeep A. Waghuley

Director, IQAC

Dept. of Physics,

Sant Gadge Baba Amravati University, Amravati.



MESSAGE

I welcome you to 2022 RAMAN 2nd International Conference on Recent Advances in Material Science and Nanotechnology being held at G. S. Tompe Arts, Commerce and Science College, Chandur Bazar, India during May 12-14, 2022.

This conference was planned by Prof Dr Devraj Singh and Dr V B Pawade, Founders of RAMAN Conference Series under the guidance and valuable suggestions by the esteemed members of Executive Council. First, I wish to thank all the members of Executive council and members of International and National advisory committees of RAMAN-2022 who have endeavoured to establish the conference.

The RAMAN-2022 is hosted by the Department of Physics, G. S. Tompe Arts, Commerce and Science College, Chandur Bazar and IQAC, SGB Amravati University, Amravati. Principal Dr R S Ramteke and Prof Dr S A Waghuley, Conference Chair, Dr D R Bijwe, Convener, Dr P S Deole, Organizing Secretary, Co-conveners and chairs of various committees are working hard to make the RAMAN-2022 succeed.

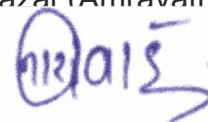
I hope the RAMAN-2022 will provide a unique opportunity for the teachers, educators, experts and scholars of higher education from all over the world to convene and share novel ideas on the field and trends in higher education development. Further, the RAMAN-2022 is organized with an aim, to exchange new thoughts and share the latest knowledge in field of material science and Nanotechnology by the eminent experts and to motivate budding Scientist and young researchers. I trust all the participants and delegates would be with some value addition to their current knowledge after attending the conference.

The RAMAN-2022 will be endorsed by a strong scientific and technical program and by the attendance of academicians, scientists, researchers and delegates from various countries. I believe that it is very important for us to discuss interesting topics and exchange ideas. The RAMAN Conference Series will be continued to stimulate and inspire the researchers.

I would like to give special thanks to G. S. Tompe Mahavidyalaya Sarvajanic Trust's, Chandur Bazar, DST-SERB, New Delhi and all organizational sponsors of the RAMAN-2022.

I wish the RAMAN-2022 will be an enjoyable, memorable and productive for the participants. I believe all delegates will benefit substantially from the conference through the presentations of expert speakers and exchange of ideas with one another.

I hope you have an enjoyable stay at the RAMAN-2022 in Chandur Bazar (Amravati), India and I'm looking forward to seeing you there.



Dr. N. R. Pawar

Founder
RAMAN Conference Series



From the Convener's Desk

It is my great privilege to welcome you all to the 2nd International Conference on "Recent Advances in Material Science and Nanotechnology" being organized by the Department of Physics, G. S. Tompe Arts, Commerce & Science College, Chandur Bazar, Dist.- Amravati . In Collaboration with I.Q.A.C., Sant Gadge Baba Amravati University, Amravati. It is a matter of great pleasure for me to present a souvenir on the occasion of the International Conference. It's a collection of abstracts of accepted research papers from various learned scholars and faculties.

This conference has been a meeting place for researchers, academicians, scientist in various branches of Physics and Chemistry to come together and exchange ideas and understand one another. It is a golden opportunity for young researchers to participate in the conference.

The founts of our inspiration are Hon'ble Mr. Keshavdada Tompe, President, Hon'ble Mr. Bhaskardada Tompe, Secretary and Hon'ble Dr. Vijay K. Tompe, Member of G. S. Tompe Mahavidyalay Sarvajanic Trust's. I am deeply indebted to our dynamic principal Dr. R. S. Ramteke for valuable suggestions, constant support and encouragement. I must acknowledge the keen interest and remarkable co-operation of Advisory committee member. Their support and motivation always boost us throughout this mammoth task.

It is truly said for every success there is some one behind it. It is the support of delegates from various organizations for this conference. We have been blessed by receiving the message from Hon'ble Vice-Chancellor Dr. Dilip Malkhede sir, , S. G. B. A.U. Amravati and Dr. S. S. Yawale madam, Director Pre-IAS Academy, Amravati for their cooperation in this souvenir. I am extremely grateful to Prof. Vladimir V. Petrov and Dr. Luca Pellegrino for accepting our invitation for the talk. The staff of entire college has indeed taken pains ensuring the success of conference, it cannot be successful being one. I am grateful to the management of our Institute for financial and liberal support.

The organizing committee is indebted to keynote and invited speakers for their kind consent, providing summary of their research contribution and sharing their knowledge for growth of material science in India. I am also thankful to all the learned participants for their overwhelming response. Thanks are also due to our International, National and Local advisory committee for their thought provoking interventions and suggestions. The financial assistance provided by DST-SERB, New Delhi, Sant Gadge Baba Amravati University, Amravati are also gratefully acknowledged. My deep sense of appreciation and thanks to advertisement or sponsorship.

I must acknowledge the strong and active support received from Dr. P. S. Deole, organizing secretary, Dr. A. V. Rajgure, Prof. M. N. Pawar & Dr. A. R. Bansod Co-convener of the conference. This event would not have been possible without the relentless efforts of all my colleagues, non-teaching staff, P. G. students and members of organizing committee. I thank them all from the core of my heart. I also extend my sincere thank to Vikasdada Satpute and Mr. Shekhar for souvenir & other printing in stipulated span of time.

Last but not the least, I thank all the delegates, invited guests, audience for their presence and cooperation in the conference.

Dr. D. R. Bijwe
Convener, RAMAN-2022

MESSAGE

I am pleased to bring the book of Abstract of Research Paper of the three days DST-SERB, New Delhi Sponsored 2nd International Conference on 'Recent Advances in Material Science and Nanotechnology (Raman 2022)' on behalf of G. S. Tompe Arts, Commerce and Science College Chandur Bazar, Amravati, Maharashtra. it is my honour to Welcome the eminent personalities of various nationally recognized Departments and Institutes to the Conference.

Raman 2022 serves as Global platform for various form of knowledge sharing irrespective of differences in time and geography. This conference serve as an excellent forum to explore the innovative research in Physics particular and general science specifically. I express my sense of gratitude to Honorable Shri. Keshavdada Tompe, President, G. S .Tompe Sarvjanik Trust, Chandur Bazar, Amravati whose blessings are always with us and it is their support that always strengthen us and his words motivate us to conduct various conference and programs in our college.

I am thankful to Honorable Shri. Bhaskardada Tompe, Secretary, G. S . Tompe Sarvjanik Trust, Chandur Bazar, Amravati whose dynamic leadership and consistent support have provided us inspiration to organise this conference.

I sincerely thank to the Principal of our college Dr. R. S. Ramteke for his support, motivation and encouragement without which this event could not have been organised. I am grateful to all resource persons and eminent personalities of the conference.

I extend my regards to the members of international Advisory Committee, National Advisory Committee, Members of local Organising Committee, Researchers, Participants & Students for their kind co- operation and encouragement. I am thankful to teaching and non- teaching staff of our college who burn the Midnight oil for the success of this event.

I am thankful to those who have contributed directly or indirectly to make this event extremely successful.

Dr. Priya S. Deole

Organising Secretary & Head, Dept. of Physics

RAMAN 2022



MESSAGE

It is a great privilege for us to welcome you all at the outset of the Abstract book of the three days DST-SERB, New Delhi Sponsored 2nd International conference on Recent advances in material science and nanotechnology (Raman 2022)

The world has witnessed the rapid advancement in the field of Science & Technology. This Conference aims at providing a forum for Scientists, Researchers, academicians,, industry executives and other Professionals to discuss the recent advancement and share Knowledge .

In fact substantial result impartation is possible only through collective vision and collaborative approach there fore this is one such attempt to move in this direction.

Our college with proactive support and guidance from management is taking number of initiative to improve the quality of education. We extend our sincere thanks to our petron honorable Keshav Dada Tompe, President, G.S. Tompe Sarvjanik Trust Chandur Bazar Amravati for his whole hearted support to this conference.

We are also thankful to honorable Bhaskardada Tompe, secretary G.S . Tompe sarvjanik Trust, Chandur Bazar, Amravati, for their constant and generous support & encouragement in this respect.

We are also thankful to the eminent members of the advisory Committee members. We sincerely thank to the principal of our college Dr R.S Ramteke for their precious guidance for organizing this event.

Our thanks to teaching and non teaching staff members of our college for their whole hearted co- operation for the success of this event. Last but not least , We thank all the resource persons, invited Guests , delegates for their active & enthusiastic response.

Dr. Ashutosh V. Rajgure & Miss. Manjusha N. Pawar
Dept. Of Physics & Co- Convenor of Raman 2022.

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2ND International Conference on Recent Advances in
Material Science and NanoTechnology

KEY NOTE ADDRESS

Raman spectroscopy for characterisation of materials

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Abstract :

Raman scattering of molecules was predicted in 1923 by A.Smekel. In 1928, Sir.C.V.Raman demonstrated (in IACS, Kolkata), a simple experiment, wherein violet light of solar spectrum was isolated with violet filter and passed through a liquid sample. While most of the light emerging from sample was violet, some of the scattered light was of green color (isolated using green filter). He showed this effect in 60 liquid samples. Raman effect was a weak effect (1 in 10⁶ molecules only showed change in wavelength). These results were published in Indian journal of physics in Mach 1928. Around 1930-40, there were 700 papers reporting study of the vibration and rotation of molecules using Raman spectra, while chemists used Raman spectra as analytical tool. Work in Raman spectroscopy proceeded fast only after the invention of intense light source, laser in sixties. In this talk, the principle of Raman scattering, the underlying mechanism of stokes and anitstokes shift, the use of laser in generating intense coherent light source, instrumentation and advantages of Raman spectra over infrared spectra in characterising different materials will be described. The modified Raman techniques such as, Resonance Raman spectroscopy, stimulated Raman Scattering, Coherent Antistokes Raman scattering, Surface Enhanced Raman Scattering and Fourier Transformed Raman Spectra will be discussed. The applications of Raman spectroscopy for inorganic, organic and biological and medical applications will be described in detail.

PLANERY TALKS

HOLOGRAPHIC ACOUSTOOPTIC DISPLAY

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Modern information processing technologies make it possible today to process, store and transmit a large amount of information including visual.

From the point of view of a more detailed representation of the object under study, 3D video is the more attractive tool.

Among the huge number of 3D video technologies, holography is the most informative.

In this paper we propose and consider a technology that allows you to create 3D moving scenes (actually video) based on acoustooptic holography.

The main idea of this approach is the assumption that a static optical hologram might be substituted by electronically controlled hologram that represents the acoustic (ultrasonic) field. Such a field creates spatial distribution of the refractive index of the medium exactly equal to the spatial distribution of transparency function of an optically recorded hologram.

The acoustic field in this case, due to acoustooptic effect, is considered as a diffraction grating for the reference light.

We proposed to extend the sound hologram model to an acoustooptic cell based on the bulk sound waves. Such cell might be considered as the best candidate for the proposed type of holographic display design (Denisyuk thick hologram model).

The basic principles of such a proposed technology are considered and discussed.

Phosphors and Their applications

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Abstract :

In the current era of modern technology, due to increase in demand of energy saving and environmental friendly product, new and advanced non-toxic optical materials received a global attention. In the past few decades, luminescence materials i.e. phosphors show crucial utilization for development of luminescence technology on the depends on characteristics of phosphors such as method of excitation, as fluorescence, bioluminescence, and phosphorescence, can results from chemical reactions, electrical energy, subatomic motions, reactions in crystals, or stimulation of an atomic system. This subject continues to have a major technological role for humankind in the form of applications such as organic and inorganic light emitters for optical devices. Recently, luminescence materials have gained appreciable attentiveness and evinced promising utilization in solid-state display devices, particularly for white-LEDs (light emitting diodes), optical sensors, bio-imaging, plants cultivation, solar cells, radiation dosimetry, phototherapy, mosquitoes repellent, fingerprints, biosensor and lasers, ascribed to their micro-nanocrystalline behaviour, superior thermal and chemical stability and the most desirable environmental friendly features. In this presentation discuss the cover all possible applications of phosphors.

Keywords: Luminescence; plant cultivations; displays; sensor.

Dielectric relaxation in conducting polymers

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The conducting Polymers such as polyaniline, polypyrrole, polythiophene and etc. have prominent role in the fabrication of solid state devices and biosensor because of their special characteristics. The properties like electrical conductivity and dielectric constant etc. can be effectively controlled by the addition of dopant. The embedded system called composites has some peculiar characteristics or features. The polymer nano-composites have good dielectric properties hence these materials are exploited as excellent functional materials. Because the embedded nanoparticles in a conducting polymer act as small defects that results in to intrinsic and extrinsic interfacial regions. In this review the synthesis of polypyrrole, polyaniline and poly 3,4 ethylenedioxythiophene-polystyrene sulphonate (PEDOT-PSS) is reported. The samples are characteristics by XRD, SEM and FTIR. Low and high frequency dielectric measurements are carried out at different temperatures.

Low and high frequency dielectric measurement are carried out on LCR-Q meter and time domain reflectometer (TDR) respectively. Dielectric constant and dielectric loss of polypyrrole and polythiophene doped samples is reported to be very high and it is strongly dependent on low frequency. Mostly Debye type relaxation is reported. At microwave frequencies the dielectric constant and dielectric loss is found to be small. Dielectric loss shoes two peaks with frequency variation suggesting two types of relaxations. Results are explained on the basis of existing theories of dielectrics.

Oxide Nanomechanics

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Complex oxides offer the opportunity to add multifunctionalities to numerous thin film devices. The growth of these materials in thin epitaxial films over substrates with selected crystallographic orientations allows engineering micro&nanomechanical devices with tailored structural properties. In this talk, I will review some of our results in the field of oxide nanomechanics, where the peculiar physical properties of selected complex oxides -such as the occurrence of structural or magnetic phase transitions - are exploited for the fabrication of thin film microactuators, memories and sensors. I will focus on the fabrication processes of oxide MEMS and on their basic mechanical characterizations, with particular attention to the role of thin film strain in the device behavior. I will also show some examples of devices made with (La,Sr)MnO₃ and VO₂ thin films. Projects websites: www.oxinems.eu, www.vo2actuators.spin.cnr.it

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**Perovskite: fullerene bulk heterojunction using microemulsion scheme:
Modelling, Simulation and experimental studies**

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Abstract :

Methylammonium Lead Iodide ($\text{CH}_3\text{NH}_3\text{PbI}_3$) perovskite material has attracted attention as a promising photoactive material due to its excellent optoelectronics properties. The performance of the perovskite solar cells has been improved significantly and has achieved efficiency of more than 25.5%. Organic-inorganic lead halide Perovskite suffer from disadvantages like charge mobility mismatch and phase instability. It has been proposed that, incorporation of acceptor material like fullerene derivative, inorganic Quantum dots in perovskite matrix, forming a bulk-heterojunction (BHJ) structure, will balance the charge extraction and additionally enhance the stability of $\text{CH}_3\text{NH}_3\text{PbI}_3$ perovskite phase. However, solubility of the components of BHJ in single solution may pose problems in single-step synthesis of BHJ. Here, we report a novel way of preparing perovskite: fullerene derivative BHJ using Micro Emulsion scheme. A critical initial acetone volume fraction is essential to maintain the stability of the microemulsion till complete solidification of the BHJ. With the help of theoretical simulation, we studied evaporation dynamics of microemulsion with a range of initial acetone volume, which can take SFME from instability to stability state. It was observed that, depending on the initial acetone volume fraction and substrate temperature, the solidifying thin film of microemulsion on the substrate may transit through different states related to its stability. This can have marked effect on the structural and optoelectronic properties of BHJ. Experimental studies confirmed these predictions. This method can open a novel way of tailoring Perovskite:Organic BHJ for optimum performance in optoelectronic devices.

Nanostructured Metal Oxide Thin Films for Supercapacitor Applications

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Abstract :

Energy is a most important theme of today's discussion in research. The rising prices, global warming and pollution are among the difficulties associated with the dependency of modern society on fossil fuels. For solving global energy demands and problem of environmental pollution; researchers are coming with ecological and reproducible energy devices. Storage of the energy is significant than its creation. Throughout the last decade, many efforts have been made to discover storage devices with high energy and power density. Among the existing storage technologies, supercapacitors have drawn great attention due to their greater power density, longer cycle life than batteries and more energy density as compared with conventional capacitors, and bridging function for the power/energy gap between traditional dielectric capacitors (high power density) and batteries/fuel cells (high energy density). In certain applications requiring the low energy and high power density including electric power tools, mobile phone chargers and portable vacuum cleaners, supercapacitors have already started to replace the batteries. The key advantages of supercapacitors are; can be fully charged in minutes rather than hours, as with batteries, and possesses higher power density. The major limiting factor for the application of supercapacitors in place of batteries is their lower energy density. Transition metal oxides/hydroxides usually show good electrochemical activity and discharge performance, due to their large specific surface areas. The nanostructured metal oxide thin films can be deposited by several methods.

In this talk I will discuss the synthesis method like chemical spray pyrolysis. I will also discuss the nanostructured metal oxide thin films for supercapacitor applications.

Keywords: Chemical Synthesis; Structural Properties; FESEM; Supercapacitors; Energy Storage;

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Sol-gel derived advanced materials- aerogels, coatings and gas sensors

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Abstract :

Sol-gel processing has been practiced for more than a century. However, the rapid growth of the field in the past 30 years has been due to the integration of sol-gel techniques into other areas of materials science such as polymers, soft matter, nanostructured materials, and biomaterials. The resulting multidisciplinary approach has allowed the emergence of highly complex materials and new functionalities. Today, sol-gel processing is used in a wide range of industrial sectors and applications from sensors, coatings, aerogel insulation and many

more. The talk is devoted to fostering an integrative approach to materials and technologies that are prepared and applied using the latest developments in sol-gel methods. Further, it will serve a knowledge for a broad audience of individuals involved in research and product development, and will be of value to advanced undergraduate and graduate students in materials science and engineering.

Elastic, Mechanical and Thermal Properties of Rare-earth Materials by Ultrasonic Analysis

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Abstract :

The ultrasonic non-destructive technique (US-NDT) is the mostly preferred technique for material characterization. It has gained much attention in the area of materials science as there is no impairment of properties and does not affect the future usefulness of the sample under testing. The ultrasonic techniques are the versatile tools to investigate the material properties such as microstructure, elastic modulus, grain size and the mechanical properties, velocity, attenuation, etc. This field has evolved mainly in the last few decades and is involved in developing new materials and modifying available materials by gaining a better understanding of characteristics under different physical conditions. These materials are thus referred to as condensed materials which have proven their potentials in many applications. Out of emerging materials, the exceptional structural, elastic, electrical, magnetic, phonon, and thermal characteristics of rare-earth compounds have attracted attention, as they are of technological significance. These materials crystallize into a basic NaCl structure, making them interesting samples for experimental and theoretical study. One of the most important reasons for the theoretical investigation of rare-earth compounds was the existence of a single crystal of chosen materials. After it was demonstrated that some rare-earth compounds can be grown epitaxially on III-V semiconductors, the interest in these materials has expanded even more recently. It has paved the path for their use in the manufacturing industry, infrared detectors, optoelectronic devices, spintronics, and several research domains.

Keywords: Condensed materials, elastic constants, ultrasonic velocity, thermal properties, ultrasonic attenuation

Tailoring of Perovskites films for Efficient and Stable Building Integrated Perovskite Solar cell devices

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Perovskite solar cell (PSC) technology has attracted much attention of scientific community and industries as efficiency goes beyond ~25.2% in very short time duration. The high efficiency in perovskite based solar cell is possible because of its interesting optoelectronic properties such as high absorption coefficients, ambipolar charge transport, long carrier diffusion lengths and quite different defect physics suitable for photovoltaic applications. The efficiency of PSC is comparable to the commercially available Si based devices. Due to this reason, PSC is expected to lead the future of photovoltaic technology which is cost effective and exhibit mechanical flexibility. Currently, most of high efficiency devices are fabricated using polycrystalline perovskite films which contain large number of grain boundaries (GB). These GBs offers a large number of recombination centers which hampers the device performance and its stability. These (GBs) defects can be minimized using various passivation methods. In present talk I will discuss about the approaches for defect passivation via different interface engineering methods and semitransparent perovskite solar cell devices for building integration.

INVITED TALKS

Carbon Rich Materials: A Possible Source of Various Forms of Carbon for futuristic applications

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Carbon materials have attracted increasing attentions due to their significant electrical and mechanical properties. The advantage of using these materials lies in its low weight, corrosion resistance, good conductivity, large surface area and thermal as well as chemical stability. In addition to these, carbon can be coated on any geometrically complex body. Usually, precursors for getting nano and other forms of carbon are various types of hydrocarbons derived from fossil fuels like methane etc., which can be catalytically decomposed into carbon atoms in a chemical vapour deposition unit. But these sources are about to deplete in near future. Thus, carbon rich waste materials can be seen as a replacement for hydrocarbons. Especially, garbage along with food and plant waste which are one of the causes of environmental pollution. Many of these contents are observed to be a rich source of carbon. With this perspective, we have tried to synthesize various forms of carbon from carbon rich compounds as well as waste material. Study of these materials has explored their potential as a microwave absorber, ferromagnetic material at low temperature, high T_c Superconducting material, radiation absorber in X- and Ku- band for stealthy defense system etc. In addition these materials may be useful for some other applications e.g. hydrogen storage, super capacitor etc. after detail study of their electrical and physical properties.

Commercialization of Academic Research: Business perspective

Abhay D. Deshmukh

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Abstract :

Innovation is the outcome of strategic planning and structured scheme of research work. There is a great emphasis on commercialization of innovation originating from Universities, academia and research institutes. Mainly, the innovations are coming from the University faculties and students entering every year with new concepts and ideas leads to new research. The core challenge is to convert ideas originating from academia to innovation and to convert it to commercially viable products. Government of India (GOI) has created an ecosystem to cater the need of people through universities by establishing the innovation and incubation centres. In the current trend, universities must raise the business value of knowledge transfer via new commercial innovations. The plausible suggestions towards research commercialization via different approach needs to understand for the benefit of students and society.

Fabrication and performance of the copper based chalcogenide solar cell devicesN.L. Tarwal^{1,2}¹Smart Materials Research Laboratory, Department of Physics, Shivaji University, Kolhapur 416004 (M.S.), India.²Research Institute for Solar and Sustainable Energies (RISE), Gwangju Institute of Science and Technology (GIST), Gwangju 500-712, Republic of Korea.³Thin Film Materials Laboratory, Department of Physics, Shivaji University, Kolhapur-416004(M.S.), India.

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Abstract :

Copper based quaternary compounds such as Copper Indium Gallium Sulfide/Selenide (CIGS) and Copper Zinc Tin Sulfide/Selenide (CZTS) are the promising candidates for production of low-cost thin film solar cells due to their tunable direct band gaps (~1.0-1.5 eV), large absorption coefficient and high natural abundance of all constituents.

Herein, we report the synthesis of CIGS and CZTS films having compact layer with average thickness of ~2 μm and their solar cell performance. The deposited films were further sulfurized at 550 °C in order to obtain stoichiometric films. The prepared films were characterized by using the XRD, SEM, Cross-sectional SEM, EDAX, Raman, XPS, etc. The solar cell devices were fabricated by using the optimized backend processes. I-V characteristics of the fabricated CIGS and CZTS solar cell devices were investigated and discussed.

Keywords: CIGS; CZTS; XPS; Solar cells

Spin-Field Effect Transistor (s-FET) - The Transistor of the Future

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Abstract :

Spintronics is rapidly emerging area of research, which deals with the use of electron spin degree of freedom instead of/in addition to electrical charge of electron. However, spin-polarization is very important condition for spintronics application which can easily be achieved by using ferromagnetic materials. In scientific community, graphene is well accepted class of material which has important features as light weight, good transport properties and ease of synthesis. In the present invited talk, the interaction between graphene and transition metal (Fe, Co and Ni), in the context of ferromagnetism was analyzed. Fe-Graphene, Co-Graphene and Ni-Graphene samples were prepared by simple ex-situ approach followed by probe-sonication technique. The prepared samples were characterized by X-ray diffraction (XRD) technique and Scanning Electron Microscope (SEM) analysis. To study magnetic properties of prepared samples, few tests were performed on instruments namely Vibrating Sample Magnetometer (VSM) technique, Magnetoconductance Study, Temperature-dependent Magnetization Measurements and Large positive Magnetoresistance Study. Results obtained were analyzed specially in the context of Spin-Field Effect Transistor (s-FET) application.

After successfully identification of ferromagnetic material, the research work presented is the experimentation of graphene-based spin-Field Effect Transistors (s-FET) of two types namely, Top-Gated s-FET and Back-Gated s-FET. The Ohmic contact behavior was analyzed as Co-Graphene nanosheets (CGNs) used as ferromagnetic electrode for both types of s-FETs. The magnetoresistance (MR) study is conducted for both devices as a function of temperature and gate voltage. Study shows that MR monotonically reduces as temperature increases. For greater insight into the functioning of device, spin-polarization values were estimated at different temperatures. Switching action in both the devices was analyzed and finally it is found that Top-Gated Type s-FET shows appropriate switching action.

Sawdust - Polystyrene based Pellets and SiO₂ - Polystyrene based Leaf Mesh for effective Oil-Water Separation

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Abstract :

Water pollution by oil is one of the key issue worldwide. Herein we developed a novel strategy to fabricate low-cost and free-standing sawdust-polymer based superhydrophobic pellets for effective oil-water separation. Instead of costly nanoparticles, we used sawdust nanoparticles in combination with polymer to attain Sawdust-Polystyrene (SD - PS) composite pellets. To achieve crack-free, regular and robust superhydrophobic SD - PS pellet, the concentration of polystyrene, the quantity of sawdust in polymer solution and thickness of the pellet was optimized. The superhydrophobic pellet exhibited oil-water separation efficiency higher than 90 % for the oils and organic liquids like hexane, kerosene, diesel and coconut oil with excellent separation cycles around 30. The mechanically durable superhydrophobic SD - PS pellet could separate oil from muddy as well as warm water, which are more suitable for industrial applications. Nanocomposite of SiO₂ and polystyrene (SiO₂-PS) deposited on a naturally dried Tectona grandis leaf mesh showed excellent superhydrophobic and superoleophilic properties. The obtained multifunctional leaf mesh exhibited fast separation of various oils like petrol, kerosene, diesel, coconut oil from oil-water mixtures with separation efficiency greater than 95%, which lasts for more than 18 separation cycles.

Keywords: Superhydrophobic; Lotus leaf; Wetting; Contact angle; Wenzel's state

ABSTRACTS

RAMAN-01

Optimization of Supercapacitive Properties of Polyindole by Dispersion of MnO₂ NanoparticlesK. D. Jagtap^a, R. V. Barde^b, D. P. Rathod^c^a Department of Physics, Indira Gandhi Kala Mahavidyalay, Ralegaon, India.^b Department of Physics, Government Vidarbha Institute of Science and Humanities, Amravati 444 604, India.^c Department of Physics, Shri Shivaji Science College, Amravati 444 602, India.**Abstract :**

This study demonstrates the dispersion of MnO₂ nanoparticles in Polyindole (PI) to optimize the supercapacitive properties of MnO₂-PI composites. As expected, the supercapacitive properties of MnO₂-PI composites influenced by the addition of MnO₂ nanoparticles and it is optimized for 1 wt.% of MnO₂ concentration. The 1 Wt.% MnO₂ loaded PI composite shows specific capacitance of the order 1558 Fg⁻¹ at a scan rate of 50 mV s⁻¹. The main accomplishment of present work is that the 1 Wt.% MnO₂ loaded PI composite shows long-term stability that is capacitance retention up to 6000 cycles. Similarly, galvanostatic charge/discharge curves of 1 Wt.% MnO₂ loaded PI composite shows long nearly symmetric behavior which is suitable for range of practical applications.

Keywords: Supercapacitive Properties; Polyindole; MnO₂ Nanoparticles

RAMAN-02

Synthesis and characterization of silver nanoparticles using fresh water Hydrilla spp.Draupadi M. Dhage¹, Yogesh D. Akhare¹, Pramod U. Ingle², Aniket K. Gade²¹Department of Zoology, Vidya Bharti College, Amravati- 444602²Department of Biotechnology, SantGadge Baba Amravati University, Amravati- 444602

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Abstract:

'Algae' are an important members of aquatic photosynthesizing microorganisms in water bodies. Chlorophytes, charophytes and glaucocystophytes constitutes fresh water green algae. Macroalgae (seaweeds) and microalgae (phytoplanktons) are natural feed for fresh water fishes. Fresh water algae like spirulina are nutritionally important as they are a rich source of proteins. They contain high levels of B-complex and vitamin E, beta carotenes, manganese, iron, copper, zinc and selenium, essential fatty acids eg. gamma linoleic acid. This huge range of biomolecules and metabolome makes them a suitable moiety for synthesis of various metal based nanoparticles like silver nanoparticles. In this study we report the synthesis of silver nanoparticles (AgNPs) by Hydrilla spp.. Synthesized AgNPs were confirmed by color change to dark brown colloid formation showing absorption maxima at 450 nm. Nanoparticle tracking analysis confirmed AgNPs with average size of 74 +/- 13.2 nm (concentration 2X10⁹ particles/ml) and zeta potential as -17.4 mV. FTIR showed presence transmittance peaks for various metabolites stabilizing AgNPs. XRD and EDX confirmed face centered cubic crystal with more than 70% of Ag in AgNPs core. FESEM elucidated roughly spherical AgNPs. It can be concluded that green method for synthesis of AgNPs by an ecofriendly approach was developed.

Keywords: Hydrilla spp., Silver nanoparticles (AgNPs), Nanoparticle Tracking Analysis

RAMAN-03

**FORMULATION, DEVELOPMENT AND EVALUATION OF SELF FOAMING
NO RINSE BODY WASH**¹K.S, Misar, ² S.A. Bhankhede^{1,2} -Department of Cosmetic Technology, Kamla Nehru Mahavidyalaya, Nagpur, India
Corresponding author email: ketkimisar11@gmail.com (K.S.Misar)**Abstract:**

The 2018 edition of UN World Water Development Report stated that nearly 6 billion people will suffer from clean water scarcity by 2050. Cutting back on water usage and saving the environmental balance is already seen as a focus area among the consumers, 27% global consumers are trying to reuse or use less water. Now a day it is the need of the hour to use less water while bathing. Hence, the present study was undertaken with the aim to formulate and develop self-foaming no rinse body-wash by using methylperfluorobutylether as an active material. Methylperfluorobutylether is colourless, odourless, nontoxic, non-flammable liquid. It has self-foaming and cleansing property. Self-foaming no rinse bodywash were developed with two different concentrations of Methylperfluorobutylether; and final formulation with 3.5% of active was evaluated for functional parameters such as pH, colour, odour, appearance, cleansing effects, foaming ability, irritancy on skin. Also, the product was subjected to stability studies and subjective evaluation on panel of human volunteers. The results showed that the self-foaming no rinse bodywash (T-II) effectively cleanses skin with its self-foaming activity without using water and causing any harsh effects on skin.

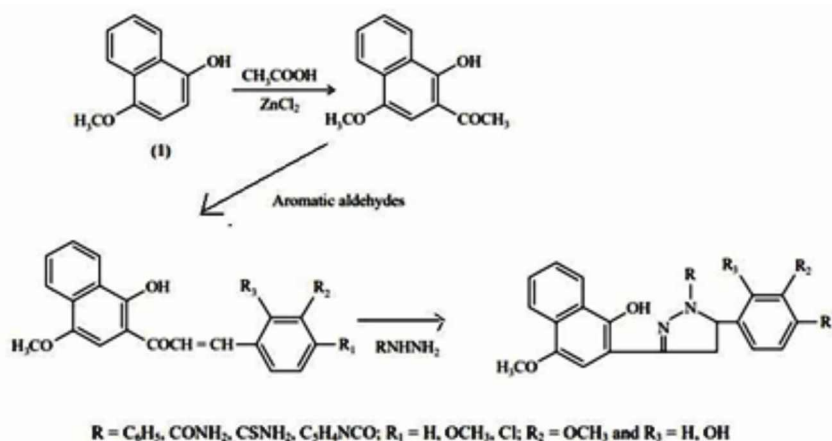
Key words : Self-foaming no rinse bodywash, methylperfluorobutylether, skin cleansing

RAMAN-04

Microwave Assisted Synthesis and Biological Evaluation of Pyrazoline Derivatives

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subodhvmv@gmail.com, archana.bijwe@gmail.com**Abstract:**

Heterocyclic fused nitrogenous cyclic compounds like pyrazoline having wide range of biological and pharmaceutical activities. 3-(2-Hydroxy -3,4-Benzophenyl-5- Methoxy) 5-Aryl -1-Substituted Pyrazolines were synthesised by green method (that is by using microwave) was carried out. The products obtained with high yield than conventional method. For the synthesised compounds study was carried out for their antimicrobial and antifungal activities. The synthesized compounds were characterized by elemental analysis, UV, ¹H NMR and IR Spectroscopy. Thin Layer Chromatography on silica gel-G, was used to check the purity of the compounds. Biological study was carried out for all newly synthesized compounds and showed an excellent results.

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RAMAN-05

Formulation and Development of Skin Cleansing Gel with Self Exfoliation¹K.S.Misar, ²A. A. Paranjape, ³ K.S. Tiwari, ⁴ M.P.Bokde^{1,2,3,4}Department of Cosmetic Technology, Kamla Nehru Mahavidyalaya, Nagpur, India

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Abstract :

The aim of present work was to study formulation and development of skin cleansing gel with self exfoliation. The idea of formulation of self-exfoliating gel was conceptualized by observing that the products available in mass market were not so gentle on the skin surface when exfoliated. Hence, exfoliating gel with Carbomer 940 and Cetrimonium Chloride was formulated with its own unique self-exfoliation property with deep cleansing effect. Cetrimonium chloride was validated by physical and chemical methods like colour, odour, pH and appearance. Suitable gel base was formulated with various concentrations of Cetrimonium chloride and the formulations were evaluated for the functional parameters. Exfoliating gel thus prepared was subjected to stability study for parameters like- colour, odour and pH at different temperatures like room temperature, at 45°C and at 40°C. Subjective evaluation of gel was carried out to study the functional parameters like ease of spreadability, self-exfoliating efficacy, cleansing effect, improvement in skin texture and irritancy on skin, on human volunteers. The study showed that exfoliating gel with 10% Cetrimonium chloride was the best formulation for self-exfoliation with deep skin cleansing effect and improvement in texture of the skin.

Key words: Cetrimonium chloride, Gel base, Self exfoliating, Cleansing of skin

RAMAN-06

Formulation and Development of Two-Phase Facial Cleansing System¹K. Misar, ²R. Gajbhiye, ³ A. Thakker, ⁴ M. Taywade^{1,2,3,4} Department of Cosmetic Technology, Kamla Nehru Mahavidyalaya, Nagpur, India

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Abstract :

The present work was undertaken to formulate and develop Two-Phase Facial Cleansing system to serve gentle cleansing feel with a unique way of application and attractive container. Two phase cleansing system was developed containing emulsion with Sodium bicarbonate and gel with Citric acid. The reaction between sodium bicarbonate and citric acid results in the formation of water and bubbles of CO₂ which gives delightful chunks that bubbles on the skin giving a refreshing feel and therapeutic benefit because it is formulated with unique chemistry and exclusive packaging. The formulation was carried out with 5 different trials of emulsion and 4 different trials of gel and finalized a stable system with emulsion (F-5) and Gel (F-4). Both the phases i.e. gel with citric acid and emulsion with sodium bicarbonate, were filled in a two-way container so that when the actuator button is pressed both the phases come out on the skin together as a final product. Both phases were evaluated for functional parameters as per BIS for Skin Creams (IS 6608:2004) and for gel pH, colour, odour, and consistency. The product was subjected to an accelerated stability study to check the stability of the product with respect to colour, odour, and pH. Subjective evaluation of the product was carried out on a panel of human volunteers. The study showed that a two-phase facial cleansing system gives excellent cleansing effect with improved skin condition in a joyful manner.

Keywords: Two-Phase facial Cleansing System, Sodium bi-carbonate emulsion, Citric acid gel.

RAMAN-07

Mesoporous rods, Microsphere, and Urchin like microstructure of NiCo₂O₄ nanoparticle via hydrothermal method for supercapacitor application.

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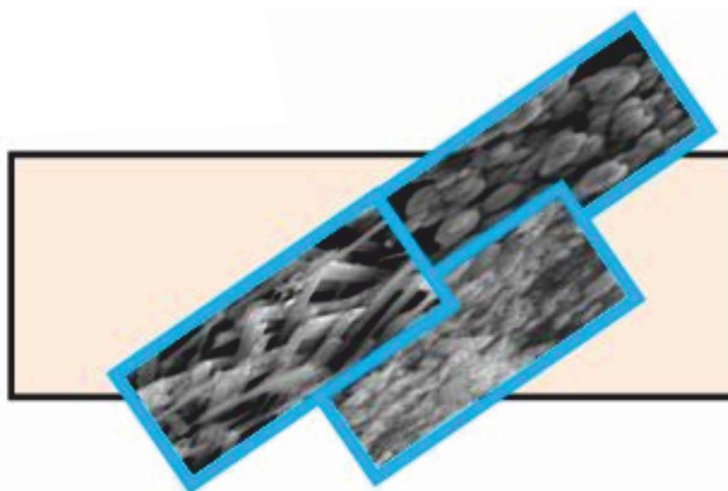
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Abstract:

The precise synthesis of different microstructure electrode materials for supercapacitor application are always challenge to obtain maximum surface area for electrode electrolyte interaction. Here in through the varying the reaction condition prepared Mesoporous nanorod, Urchin, and microsphere like microstructure Nickel cobalt oxide nanoparticles by hydrothermal method. The phase and crystallinity of nanoparticle were studied using X-ray diffraction measurement. Surface microstructure and elemental composition were studied by scanning electron microscope as shown in figure 1. Chemical state and surface elemental composition were studied by X-ray photoelectron microscopy. The specific capacitance of the electrode material were studied by cyclic voltammetry, galvanostatic charge and discharge and electrochemical impedance spectroscopy measurement in 3M KOH electrolyte. NiCo₂O₄ electrode material were used as electrode material to assemble asymmetric supercapacitor were assemble using NiCo₂O₄ electrode material as one electrode and activated carbon as second electrode. The NiCo₂O₄ nanoparticle are good potential candidate electrode material for energy storage device as a supercapacitor..

Keywords: NiCo₂O₄ nanoparticles, Hydrothermal, Mesoporous rods, Microsphere, and Urchin like microstructure, Supercapacitor.



RAMAN-08

Ultrasonic and thermophysical properties of binary and ternary alloys of transition metals Ti, Zr and Hf

Ramanshu P. Singh^{*}, Shakti Yadav, Devraj Singh and Giridhar Mishra
 Department of Physics, Prof. Rajendra Singh (Rajju Bhaiya) Institute of Physical Sciences for Study and Research, Veer Bahadur Singh Purvanchal University, Jaunpur - 222003, India

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Abstract :

In this study, we investigated room temperature mechanical and thermophysical properties such as shear and bulk moduli, Poisson's ratio, ultrasonic velocities, Debye average velocity, Debye temperature for binary and ternary alloys of Ti, Zr and Hf metals. Through Lennard-Jones potential approach, the second and third order elastic constants were computed using the hcp structural parameters of the alloys. These higher order elastic constants were, then, utilized to determine the acoustic velocities, the bulk and shear moduli, acoustic Debye temperature for the alloys and their values were found to be in good agreement with earlier experimental and theoretical studies for the same. We also calculated the specific heat at constant volume, energy density and thermal conductivity between temperature range of 100K-500K for these alloys using Debye equation with considerable approximation and found significant dependence of these parameters on temperature. Ultrasonic attenuations due to different phenomena have also been evaluated for these alloys.

Keywords: Lennard-Jones potential, elastic properties, thermophysical properties, ultrasonic attenuation

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RAMAN-09

Evaluation of Intrafraction 6D Residual Error in Spine Stereotactic Body Radiotherapy and Brain Stereotactic Radiosurgery: Analysis with kilovoltage Cone-Beam Computed Tomography.

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Abstract:

Stereotactic body radiotherapy (SBRT) and stereotactic radiosurgery (SRS) involve high dose delivery to the tumor with steep dose gradients and require high geometrical accuracy in tumor localization. This retrospective study aimed to evaluate the intrafraction residual errors in thirty patients treated for spine SBRT (15) and brain SRS (15) using kilovoltage cone-beam computed tomography (kV-CBCT) imaging (70 fractions, 280 CBCTs) on TrueBeam linear accelerator. Patient target localization was done by rigid registration of reference Planning CT (pCT) and pre-correction CBCT. Post-correction CBCT analyzed localization verification and residual errors (PC-RE). The intrafraction 6D (Lateral, longitudinal, vertical, pitch, roll, and yaw axes) residual errors were analyzed by interim CBCT after delivery of half treatment beams and post-treatment CBCT. The residual error was quantified as the difference between translations and rotations of CBCT images and reference pCT images. For Spine SBRT, the interim residual error (InPT-RE) and post-treatment residual error (PostPT-RE) were within 0.2 ± 0.6 mm and 0.10 ± 0.40 , and the maximum error was within -1.4 mm and -1.00. The frequency of residual error >0.5 mm was 29.1%, and 34.5% and >0.50 was 12.7%, and 25.5% in InPT-RE, and PostPT-RE, respectively. For brain SRS, the InPT-RE and PostPT-RE were within 0.1 ± 0.3 mm and 0.10 ± 0.20 , and the maximum error was within 0.5 mm and -0.70. The frequency of residual error >0.5 mm was 0% and 0% and >0.50 was 6.7%, and 0% in InPT-RE and PostPT-RE, respectively. The mean intrafraction residual error in translational and rotational axes for spine SBRT and brain SRS was within our threshold of 0.5 mm and 0.50. Minimal intrafraction motion is achieved via near-rigid immobilization, intrafraction CBCT imaging, and rigorous repositioning thresholds in six degrees of freedom, enabling safe spine SBRT and brain SRS delivery.

RAMAN-10

Preparation and Characterization of SnS nanoparticles by Hydrothermal Method

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Abstract : Pristine tin sulfide (SnS) nanoparticles were synthesized by conventional hydrothermal method. The $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$, Thioacetamide ($\text{C}_2\text{H}_5\text{NS}$) were used as the precursor source chemicals for Sn^{2+} and S^{2-} ions respectively. Polyvinylpyrrolidone (PVP) was used as a capping agent to regularize morphology of particles. Thus by using above mentioned method at 1800 C for 4 hrs obtained nanoparticles which were dark grey in color. The X-ray diffraction technique analysis of the nanoparticles confirmed the orthorhombic unit cell structure and all the obtained lattice parameters ($a=11.23 \text{ \AA}$, $b= 3.98 \text{ \AA}$ and $c=4.25 \text{ \AA}$) were in good agreement with the reported data in JCPDS card no. 00-067-0519. The crystallite size determined by Scherrer's formula is 16 nm using FWHM corresponding to highest peak intensity of (111). The morphology and surface structure of the nanoparticles (SnS) were sheet type (marble chips type) observed by field emission scanning electron microscopy (FESEM). The chemical composition of the nanoparticles by energy dispersive analysis of X-ray technique (EDAX) showed that ratio of tin (Sn) and sulfur (S) was perfect.

The ultra-violet-visible near infrared spectroscopy (UV-Vis) carried out in the range of 200-1200nm and calculated directed band gap value of 1.52 eV by Kubelka-Munk function and tauc plot.

Thermoelectric parameters such as type of semiconductor, carrier concentration (n), hall effect coefficient(RH), electrical conductivity and hall mobility of obtain nanoparticles were also calculated using hall effect set up at room temperature (306 K) and that were obtained as follows- P-type semiconductor, $n = 2.64 \cdot 10^{17} \text{ cm}^{-3}$, $\text{RH} = 23.663 \text{ cm}^3/\text{C}$, $\rho = 0.197 \text{ S/cm}$, $\rho_H = 4.66 \text{ cm}^2 \text{ V}^{-1} \text{ sec}^{-1}$.

Keywords: Hydrothermal Method, SnS, XRD, FESEM.

RAMAN-11

Simulation of linear Array Transducer with Center Frequency 10 MHz

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Abstract:

Over the past decades, ultrasound imaging technology has satisfied outstanding improvement in obtaining significant diagnostic information from patients in a fast, noninvasive approach. Piezoelectric transducers are important elements of various broadband ultrasonic systems, either pulse-echo or through-transmission, used for imaging and detection purposes[1]. In ultrasonic broadband applications such as medical imaging, or non-destructive testing, piezoelectric transducers should generate/receive ultrasonic signals with good efficiency over a large frequency range. This implies the use of piezoelectric transducers with high sensitivity, broad bandwidth and short-duration impulse responses. High sensitivity provides large signal amplitudes which determine a good dynamic range for the system and the short duration of the received ultra-sonic signal provides a good axial resolution. This paper presents the simulation of 32-element linear array transducers with center frequency 10 MHz, using Field-II GUI program for ultrasonic measurements.

Keywords: Ultrasonic, Linear array Transducer, medical imaging, Field-II GUI, TX/RX Fields, detected image, TX/RX Axial slice, TX/RX Axial slice.

RAMAN-12

Investigation of structural, magnetic, and microwave absorption properties of Bi Supplemented Calcium hexaferrite

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Abstract: Calcium hexaferrite ($\text{CaFe}_{12-x}\text{Bi}_x\text{O}_{19}$, $x=0.2$ to 0.8) was successfully brewed through a microwave-induced sol-gel auto-combustion technique with Bi^{3+} as a substitute. The impact of added Bi^{3+} ions on the structure, morphology, magnetic, and dielectric properties of calcium hexaferrite was analyzed using an X-ray powder diffractometer (XRD), Field emission scanning electron microscopy (FE-SEM), vibrating sample Magnetometry (VSM), The peak position in the XRD pattern confirms the development of single-phase hexagonal ferrite nanoparticles with a space group of $P6_3/mmc$ and an average crystalline size of 46 to 56 nm. Magnetic analysis revealed that when the Bi^{3+} ion is added to Ca ferrite, the material's coercive force improves, but the saturation magnetization decreases. A vector network analyzer was used to record the microwave absorption properties for the X-band (VNA). Reflection loss values were computed within the frequency range of 8-12 GHz using transmittance line theory for a given thickness of 1.2 mm. The material properties of the bismuth substituted calcium hexaferrite material can predict the layer dimension and frequency, resulting in reduced reflection loss. The most significant loss is obtained at 10.2 GHz (-9.27 dB, 75 % loss), related to the appropriate magnetic material composition.

Keywords: Calcium Hexaferrite, Bismuth, XRD, FE-SEM, VSM, VNA etc.

RAMAN-13**Physico-Chemical, Spectroscopic Characterization and Adsorption Study of Prepared Activated Carbon from Limonia Acidissima**Vaishali A. Shirbhate,¹ and Deepali P. Gulwade,²¹Department of Chemistry, Govt. Vidarbha Institute of Science and Humanities Amravati University, Amravati 444604.

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Abstract: In the present study the removal of Ni(II) by adsorption on Limonia Acidissima Shell as adsorbent has been investigated in the batch experiment. Physico-chemical characteristics of prepared activated carbon such as Bulk density, Porosity determination, Moisture content determination, Ash Content, water-soluble matter, have been carried out for adsorbent. The equilibrium data were well described by Langmuir and Freundlich adsorption isotherms. Spectroscopic Characterizations were studied to analysing internal structure of carbon by Scanning Electron Microscopy, X-ray Diffraction which provides information about the arrangement of crystal and Fourier Transform Infrared Spectroscopy has been used to detect functional groups present in the sample.

Keywords: Adsorption, impregnate, Physico-chemical Characterizations, Limonia Acidissima Shell activated carbon.

RAMAN-14**TO STUDY THE ADSORPTION EFFICIENCY OF Pb (II) FROM AQUEOUS SOLUTION USING LOW-COST ADSORBENT**

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Abstract: Lead is toxic to living systems and therefore it is essential to remove it from wastewater. The removal of Lead (II) ions from aqueous solution by using Phyllanthus emblica tree bark was investigated. Adsorption studies were performed by batch experiments. The effect of contact time, pH, adsorbent dose and temperature were explored. From the experimental data, the isotherm parameters of Freundlich and Langmuir were calculated. The equilibrium was best represented by the Langmuir. Langmuir adsorption capacity (Q₀) was found to be 3.28 mg/g.

Keywords: Adsorption, Lead (II), Langmuir, Freundlich

RAMAN-15**A Comparative dielectric study of methanol-water and Glycerol-water mixtures using TDR**Bharose N.A.¹, Chavan S.D.^{#1}, Kumbharkhane A.C.²

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Abstract: Time domain reflectometry (TDR) technique has been used in frequency range 10MHz to 20GHz to determine the dielectric parameters at room temperature. A comparative dielectric study have been done between methanol-water and Glycerol-water mixture. Relaxation time gives orientation relation between two mixtures. Dielectric constant & Kirkwood correlation factor have been studied for molecular interaction between two mixtures.

Keywords: Methanol, Glycerol, water, TDR, dielectric parameters

RAMAN-16

Variation of Energy Band Gap in Composites of N-doped Titanium Dioxide for Preparation of Dye-sensitized Solar CellShivam Yadav^a, Rupali Patel^a, Vinita Dhulia^a^a N.E.S Ratnam College of Arts Science and Commerce**Abstract:**

TiO₂ (Titania) is one of the prominent transition metal oxides, which is a widely used nanomaterial, for various applications, due to its stability, abundance, non-toxicity, and high reactivity. It is also one of the components widely used for solar cell applications. The large bandgap of TiO₂ which is approximately 3.2 eV for the anatase phase limits visible light absorption. It is only stimulated in the region of ultraviolet (UV) light i.e. wavelength less than 387 nm. We have made composites of the dye-sensitized solar cell (DSSC) with the objective of reducing the band-gap to enhance the absorption of solar spectra. Pure and N-doped TiO₂ nanoparticles are synthesized by the sol-gel method. Composites were prepared by taking varying concentration of Nitrogen and pure TiO₂. Energy band-gap for the composites were studied using Absorption Spectra obtained from characterization using a UV visible spectrophotometer. Doped TiO₂ displayed a narrow band-gap compared to the pure TiO₂ nanoparticles. IV characteristics were analyzed to check the efficiency of DSSC. It is observed that the energy band gap is reduced with increasing concentration of nitrogen.

Keywords: Dye Synthesized Solar Cell, TiO₂ nanoparticle, N-doped TiO₂, Spectrophotometer, energy band-gap

RAMAN-17

Electrical properties of lead sulphide amalgam under influence of aluminium doping deposited by chemical spray pyrolysisS. G. Ibrahim¹, S. A. Waghuley²

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Abstract :

Nanotechnology is one of the most demanding areas in the field of science and engineering. Due to this, it has become possible to engineer devices at the nanometer scale which can be utilised in the production and application of materials, structures, devices, and systems. The effect of Al doping on the electrical properties of chemically spray deposited lead sulphide thin films was investigated in this study. The films are polycrystalline in nature, with a cubic lattice, and have a direct band gap on the order of 1.49 eV, which increases to 1.62 eV as doping concentration increases. The electrical resistivity of the pure films was $2.68 \times 10^3 \Omega \text{cm}$, but it dropped to $1.35 \times 10^3 \Omega \text{cm}$ with further Al doping. Both undoped and doped thin films show p-type conductivity, according to the thermo-emf measurement.

Keywords: Thin films; Nanostructures; Spray pyrolysis; Electrical properties.
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RAMAN-18

REFRACTOMETRIC STUDIES OF SYMMETRICAL
TRIAZINOSUBSTITUTED THIOCARBAMIDES IN DIOXANE-WATER
SYSTEMS

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Abstract :

Refractometric study of 1-(4-hydroxy-6-methyl)- symmetrical triazino-3-p-tolylthiocarbamide (M1), 1-(4-hydroxy-6-methyl)-symmetrical triazino-3-m-tolylthiocarbamide (M2), 1-(4-hydroxy-6-methyl)-symmetrical triazino-3-o-tolylthiocarbamide (M3) were carried out at various percentage compositions of solvent to investigate effects of various groups on symmetrical triazino thiocarbamides. The data and the results obtained during this investigation gave detail information regarding drug ADME of all these. Taking all these things, this research work was carried out.

Keywords: 1-(4-hydroxy-6-methyl) - symmetrical triazino-3-p-tolylthiocarbamide (M1), 1-(4-hydroxy-6-methyl)-symmetrical triazino-3-m-tolylthiocarbamide (M2), 1-(4-hydroxy-6-methyl)-symmetrical triazino-3-o-tolylthiocarbamide (M3), dioxan-water percentage composition, refractometer.

RAMAN-19

A Comparative dielectric study of methanol-water and Glycerol-water
mixtures using TDRBharose N.A.¹, Chavan S.D.^{#1}, Kumbharkhane A.C.²
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Abstract: Time domain reflectometry (TDR) technique has been used in frequency range 10MHz to 20GHz to determine the dielectric parameters at room temperature. A comparative dielectric study have been done between methanol-water and Glycerol-water mixture. Relaxation time gives orientation relation between two mixtures. Dielectric constant & Kirkwood correlation factor have been studied for molecular interaction between two mixtures.

Keywords: Methanol, Glycerol, water, TDR, dielectric parameters

RAMAN-20**Synthesis and Experimental Studies of Heterocyclic Chalcone**

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Abstract: A new chalcone was synthesized by Claisen-Schmidt condensation. The solute and solvent interaction were studied on the basis of physicochemical properties like density, viscosity, refractive index etc. The physicochemical properties are varies by changing concentration, temperature and solvent etc

Keywords: Physicochemical, Chalcone synthesis. Solvent solute interaction etc.

RAMAN-21**TO STUDY THE ADSORPTION BEHAVIOUR OF COBALT (II) METAL IONS FROM AQUEOUS SOLUTION USING LOW-COST ADSORBENT**

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Abstract:

Water contaminated with cobalt (II) cause various deceases in leaving and non-leaving organisms. Removal of such kind of metal ion`s is the need of current era. Present study deals with the removal of cobalt(II) metal ions from the aqueous solution using low-cost adsorbent. The activated charcoal prepared from bone char used as a low-cost adsorbent. The various parameters like effect of pH, adsorbent dose, contact time and effect of temperature was examined for the retrieval of Co(II). Surface characterization of adsorbent was done by using SEM and FTIR. The experimental data fitted with Langmuir and Freundlich adsorption isotherm.

Keywords: Cobalt(II), Adsorption, Bone Char, Langmuir, Freundlich

RAMAN-22**MgSe thin films deposited by successive ionic layer adsorption and reaction method.**

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Abstract :

Manganese selenide have generated considerable scientific and technological interest due to their remarkable physical and chemical properties and associated applications. Magnesium Selenide thin films were fabricated using Successive Ionic Layer Adsorption and Reaction (SILAR) deposition technique at different SILAR cycles. These deposition techniques are a very simple and produce thin films at room temperature. The structural and morphological characterizations of the as deposited MgSe films have been carried out by means of X-ray diffraction (XRD), Field Emission Scanning Electron Micrograph (FESEM).

Keywords: Thin Films, XRD, SILAR method, Morphological properties

RAMAN-23**Chalcone: Synthesis and Experimental Study of New Promising Medicinal Compound.**

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Abstract: Chalcone is a common natural pigment and one of the important intermediates in flavonoid biosynthesis. Medicinal chemists continue to be fascinated by chalcone derivatives because of their simple chemistry, ease of hydrogen atom manipulation, straightforward synthesis, and a variety of promising biological activities.

The present work was undertaken to study about method of synthesis, characterization done by NMR, Mass, and IR spectroscopic techniques and different physical properties with experimental data such as molecular weight, density, refractive index and viscosity of chalcones.

Keywords : Chalcone, Molecular weight, Density, Refractive index, Viscosity etc.

RAMAN-24

Morphological and Structural Characterization of Polyaniline doped Cadmium Telluride nanocomposite

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Abstract:

Conducting polymer polyaniline doped with Cadmium Telluride (CdTe) nanocomposites are synthesized by using chemical oxidative polymerization method. Synthesis is done in aqueous medium with ammonium persulphate as an oxidant at room temperature. CdTe with 4 wt % is used for synthesis of nanocomposite. Morphological characterization of the prepared samples was done by Scanning Electron Microscopy (SEM) and structural characterization by X-ray diffraction (XRD) technique. Materials formed are polycrystalline in nature. Crystalline as well as amorphous structure with very fine particles is observed. CdTe nanoparticles are found to be deposited on surface of PANI. A nanocomposite shows crystallinity due to the addition of CdTe in PANI conducting polymer as compared to pure PANI. The X ray diffraction pattern shows that degree of crystallinity of PANI-CdTe composite is higher than that of PANI. The crystallite size of PANI-CdTe nanocomposite was estimated from X-ray line broadening using Scherer's equation and found around 50 nm.

Keywords: Polyaniline; CdTe, XRD; SEM.

RAMAN-25

Study of structural and magnetic properties of Bi Substituted nickel Spinel Ferrites

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Abstract:

Microwave-assisted sol-gel auto combustion was used to make spinel ferrite nanoparticles (NPs) of $\text{Ni}(1-(3/2)x)\text{Bi}_x\text{Fe}_2\text{O}_4$ with $x=0.0, 0.2$ and 0.4 (NPS).. X-ray diffraction (XRD) was used to determine the crystallite size of the produced NPs, which was found to be 28 and 40 nm, respectively. Coercivity H_c (167.82 Oe to 137.95 Oe), Magnetic Saturation M_s (37.257 to 25.543 emu/g), and retentivity M_r (9.0094 to 3.4970emu/g) of NiFe_2O_4 and Bi^{3+} Substituted NiFe_2O_4 were measured using a Vibrating Sample Magnetometer. The substitution of trivalent metal ions (Bi^{3+}) alters the crystallite size and cation distribution in the tetrahedral and octahedral positions, causing structural and magnetic alterations.

Keywords: - Sol-gel Auto combustion, Nickel ferrites ,Bismuth Ferrites, XRD, VSM, etc.

RAMAN-26

Synthesis, fabrication and luminescence properties of Cr³⁺ activated red light emitting phosphors for indoor plant cultivationShreyas K. Pingle^{1,2}, Yatish R. Parauha¹, Deepak Taikar^{1,2}, S.J.Dhoble¹¹Department of Physics, R.T.M. Nagpur University, Nagpur- 440033, India²Department of Physics, Shri Lemdeo Patil Mahavidyalaya, Mandhal, 441210, India

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Abstract :

Cr³⁺-activated far-red and near-infrared phosphors have drawn considerable attention owing to their adjustable emission wavelengths and wide applications. Plant cultivation, a new agricultural planting technology, has emerged and rapidly grown in recent years, with phosphor conversion light emitting diodes (pc-LEDs) considered as the first choice of source light for the plant cultivation. Previous literature suggested that, Cr³⁺ activated phosphors emit far red and near infrared red light with high efficiency. In this review, we have discussed synthesis and fabrication of red lighting phosphors. We have also been included, previously reported Cr³⁺ activated far-red and near-infrared phosphors. It is known that plant growth and development depend on different wavelengths of light. As per the literature, blue light (400-500 nm) can promote leaf growth and stomata opening, red light (600-700 nm) plays an important role in the growth of plant stems and phototropism, whereas far-red light (710-740 nm) can modify the germination and flowering stage of the plant. Therefore, it confirms that Cr³⁺ activated far-red and near-infrared phosphors can play crucial role in plant cultivation. Our study showed that Cr³⁺ activated phosphors have huge potential for indoor plant cultivation.

Keywords: Phosphor; Red emission; Plant cultivation; light emitting diodes.

RAMAN-27

Synthesis of Silver Nanoparticle Material Using Plant *PerkiaBlgandulosa*S. V. Narsing,¹ S. E. Bhandarkar,^{2B} P. Khobragade,³ V. A. Shirbhate⁴¹Department of Chemistry, Govt. Vidarbha Institute of Science and Humanities
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Abstract: Nanoparticle and nanotechnology open new theme in chemical, agriculture, industrial and life Sciences. The medicinal properties of plant due to some bioactive chemical constituents which are present in it. Silver has been recognized as a non-toxic, safe antibacterial / antifungal agent used for centuries. Silver shows a lothigh potential for a variety of biological applications, especially in the form of nanoparticles. It is in harmony with nature. Blending methods are becoming increasingly popular in chemical technologies as well as environmental needs. We synthesized silver nanoparticles from plant leaves of *PerkiaBlgandulosa*. Spectroscopic techniques such as Ultra violet radiation(UV) , X-ray diffraction (XRD), Fourier Transform Infrared spectroscopy(FTIR) was carried out for characterization. Scanning electron Microscopy(SEM) technique was employed to observe the surface morphology of nanomaterial. Synthesized nanoparticles were studied for their biological activities and found to be most active.

Keywords: Synthesis, Silver nanoparticle, *PerkiaBlgandulosa*, Characterization, Biological activity

RAMAN-28

Photoluminescence investigation of CaAl₂SiO₄F: Eu³⁺ activated red emitting phosphors for white light emitting diode

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Abstract:

In this present study, a series of CaAl₂SiO₄F: Eu³⁺ activated red emitting phosphor was successfully synthesized by solid state reaction method. The phase purity of CaAl₂SiO₄F: Eu³⁺ activated red emitting phosphor were measured by using powder X-ray diffraction (XRD) patterns verified on a RIGAKU mini flex 600 with Cu K α radiation ($\lambda = 1.5405 \text{ \AA}$). The vibration feature of the CaAl₂SiO₄F: Eu³⁺ doped is analysed by Fourier transformation infrared spectroscopy (FTIR). The photoluminescence study (PL), excitation spectra, emission spectra and including lifetime of the series CaAl₂SiO₄F: Eu³⁺ sample were measured by using SHIMADZU spectrofluorophotometer RF 5301. Upon excitation at 254 nm, 395nm, 465nm CaAl₂SiO₄F: Eu³⁺ emitted intense red colour due to ⁵D₀ → ⁷F₂ transition located at 616 nm. The morphological properties of the CaAl₂SiO₄F: Eu³⁺ sample were studied by scanning electron microscope (SEM). Commission International de l'Eclairage (CIE) chromaticity coordinates were calculated for all the prepared samples. Therefore, all these good results indicate that sample CaAl₂SiO₄F: Eu³⁺ is a promising red phosphor for the application of white light-emitting diodes (WLEDs).

Keywords: photoluminescence; solid state diffusion; red phosphor; white LEDs; XRD; FTIR.

RAMAN-29

THE CRYSTALLIZATION BEHAVIOUR OF SILVER DOPED LEAD BORATE GLASSES

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Abstract :

The differential scanning calorimetric technique of characterization of glasses (5-30 mol% Ag₂O) was obtained to study the glass transition and crystallization behavior of amorphous solids. The quality control for monitoring glass synthesis because the overall behavior of the glass depends on glass transition temperature (T_g) and the different phase formation in the samples.

Keywords: Lead silver borate glasses, dc electrical conductivity, ionic conduction, Ag⁺ ions.

RAMAN-30

Theoretical Investigation of Mechanical and thermophysical properties of 5d- transition metal mononitrides

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Abstract :

In present study, we have investigated the mechanical and thermo-elastic properties of 5d- transition metal mononitrides XN (X: Hf, Ta and La) using the second and third order elastic constants (SOECs and TOECs). Coulomb and Born-Mayer potential up to second nearest neighbours has been used to compute SOECs and TOECs in the temperature range 0 K to 500 K. In order to explore mechanical stability and nature of the materials the Born stability criteria has been analyzed. Young's modulus, bulk modulus, shear modulus, Zener anisotropy and Poisson's ratio have been computed using SOECs. The wave velocities for shear and longitudinal modes of propagation, Debye average velocity and ultrasonic Grüneisen parameters have been computed in the temperature range 100 K to 500 K. Using Slack's approach thermal conductivity of chosen materials has been evaluated and the Debye's theory has been used for the calculation of specific heat and total internal thermal energy in the temperature range 100 K to 500 K. Thermal relaxation time and acoustic coupling constant has been computed at different temperatures and in different orientations. The evaluation of longitudinal and shear components of ultrasonic attenuation has been done along the three crystallographic directions comprising $\langle 100 \rangle$, $\langle 110 \rangle$, and $\langle 111 \rangle$. The outcomes of present investigation have been compared with available other similar type of materials.

Keywords: Transition metal mononitrides, elastic properties, Born-Mayer potential, ultrasonic attenuation.

RAMAN-31

Synthesis and Photoluminescence Studies of UV emitting Mg₂P₂O₇: Gd Phosphor

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Abstract:

Gadolinium doped Mg₂P₂O₇ phosphor is prepared with slow vaporization method. The phase analysis of this synthesized material was determined using powder X-ray diffraction (XRD). Photoluminescence properties of UV emitting phosphor Mg₂P₂O₇: Gd³⁺ with varying concentration of Gd³⁺ was studied. Crystal structure and co-ordination of prepared phosphor was confirmed using powder X-ray diffraction and FTIR. SEM images of prepared powder samples show the irregular grains with agglomeration phenomena. Under the excitation of 274 nm phosphor materials show two emissions at 304 nm and 312 nm, which could be applicable in phototherapy. These lines correspond to the $6P_{5/2} \rightarrow 8S$ and $6P_{7/2} \rightarrow 8S$ transitions of the Gd³⁺ ion, respectively. The maximum intensity of luminescence in synthesized materials was investigated.

Keywords: UV emitter, Photoluminescence, Gadolinium, Pyrophosphate

RAMAN-32

Synthesis and Characterization of LiBaB9O15:Gd3+ PhosphorN. D. Kherde¹, P. A. Nagpure^{1*} and S. K. Omanwar²¹ Department of Physics, Shri Shivaji Science College, Amravati 444 603, (Affiliated to S.G.B.A. University, Amravati) Maharashtra, India.² Department of Physics, S.G.B.A. University, Amravati 444 602, Maharashtra, India.

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Abstract:

In this paper we have reported the synthesis and the photoluminescence properties of the phosphor LiBaB9O15:Gd3+. This phosphor material was prepared by the solution combustion method followed by the sintering at 750°C for 90 minutes. The structural properties of the phosphor were studied by X-ray Diffraction Pattern. The photoluminescence spectra of this phosphor investigate under the excitation of 277nm, which shows emission at 384 nm. This shows the application of the phosphor in various fields like photocopying, phototherapy.

RAMAN-33

Effect of Tb3+ ion concentration on photoluminescence studies of K2Ca(PO4)F phosphorSagar Pawar^a, Rahul S. Pawar^{b,c}, Yatish R. Parauha^a, Rupali H. Mahakhode^{b,c}, N. S. Shirbhate^d, S. J. Dhoble^{a*}^aDepartment of Physics, R.T.M. Nagpur University, Nagpur- 440033, India^bDepartment of Botany, S.S.E.S. Amravati's Science College, Nagpur-440012, India^cDepartment of Botany, R.T.M. Nagpur University, Nagpur- 440033, India^dVidyaVikas Arts, Commerce and Science College, Samudrapur, Wardha, India

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Abstract:

In the current investigation, a series of Tb3+ (0.4, 0.8, 1.2, 1.6, 2.0 mol%) activated K2Ca(PO4)F phosphors have been successfully synthesized by solid state reaction method. The synthesized phosphor was investigated by various techniques such as X-ray diffraction pattern (XRD), Fourier Transform Infrared (FT-IR), thermogravimetry, and differential thermal analysis (TG-DTA), UV diffuse reflectance spectra (UVDRS), photoluminescence (PL) etc. The PL excitation and emission spectra of the synthesized phosphors show interesting results. The excitation spectrum showed three excitation bands around 240 nm, 378 nm and 464 nm, which are ascribed due to f-d transitions of Tb3+ ions. Under these excitation, the prominent peaks observed at 490 nm and 544 nm due to 5D4 → 7F6 and 5D4 → 7F5 transition of Tb3+ ions. In the PL studies, an intense peak was observed in the green region and its intensity increased with increasing Tb3+ ions concentration. Concentration quenching was observed for 1.6 mol% of Tb3+ ions concentration. These results were confirmed using CIE analysis. The results support the potential for this phosphor to be used as a single source for green light emission in display devices.

Keywords: Solid state reaction method; photoluminescence; concentration quenching; display devices.

RAMAN-34

Preliminary Phytochemical Screening of Medicinal Plants used in Cosmeceutical Formulation

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Abstract:

Qualitative phytochemical screening determination of three selected medicinal plants viz. Albizia Lebbeck L. Benth (Shirisha), Acacia Catechu L.f Willd (Khadira), and Hemidesmus Indicus L. R.Br (Sariva) were carried out to know about the presence of secondary metabolites. Plant materials subjected to screening include stem-bark of Albizia Lebbeck, Acacia Catechu, and root of Hemidesmus Indicus. Six different solvents viz. water, ethanol, isopropyl alcohol, acetone, chloroform, and petroleum ether were used for extractions. These plants were analyzed for the presence of twelve important secondary metabolites such as tannins, alkaloids, anthraquinone glycosides, cardiac glycosides, flavonoids, phenol, terpenoids, steroids, saponins, carbohydrates, proteins, and amino acids using standard methods. Preliminary screening of these plant species revealed the presence of secondary metabolites which were predominantly found in aqueous and ethanolic extract followed by acetone, isopropyl alcohol, and chloroform fractions and rarely observed in petroleum ether. The presence of these secondary metabolites may be the ones responsible for the therapeutic properties. The present work is planned to study the effect of metabolites in skincare preparations.

Keywords: Albizia Lebbeck, Acacia Catechu, Hemidesmus Indicus, secondary metabolites, therapeutic properties, skincare

RAMAN-35

In-vitro selection of salt tolerant Tomato plant (Lycopersicon esculentum Mill.)

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Abstract :

The given study is based on identification of salt tolerance trait from the seeds of Tomato (Lycopersicon esculentum Mill.). Genetic diversity can be seen within a particular species. To identify a trait in a given variety is difficult to find out using morphological data. In the present study the hypocotyl were isolated and grown in increasing salt concentration of 0.5%, 1.0% and 1.5%. The tolerance observed may be due to genetic diversity or somaclonal variation within in the variety and thus can be selected for micropropagation, hybridization and other experiments.

Keywords :

2,4 D (2, 4-dichloro-phenoxyacetic acid), APX (Ascorbate peroxydase), B5 (Gamborg's Basal Media), BA (Benzyl adenine), BAP (Benzylamino purine), GA (Gibberellic acid), HgCl₂ (Mercuric chloride), invitro (performed or taking place in a test tube or elsewhere outside a living organism), somaclonal variation (variations observed among progeny of plants regenerated from somatic cells in vitro)

RAMAN-36**Molecular Interaction Study through Molar Volume, Available Volume and Free Volume for ternary liquid Mixture of Alcohol + Tri-ethylamine + Acetic Acid**P J Thakare¹Shri Shivaji College of Arts, Commerce and Science, Akola, Maharashtra
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Abstract: The density, viscosity and ultrasonic velocity of ternary liquid mixture of Alcohol + Tri-ethylamine (TEA) + Acetic acid have been measured at three different temperatures 30DEG, 35DEG and 40DEG. From these measured values, molar volume, available volume and free volume have been calculated. The nature of molecular interactions between component molecules is investigated through above parameters. The experimental results are used to interpret the molecular interactions in ternary liquid mixture.

Keywords: ternary liquid mixture, molar volume, available volume, free volume

RAMAN-37**Fabrication and Characterization of Co modified SmFeO₃ thick film**R.B.Mankar^a, V.D.Kapse^b^aDepartment of Physics, Smt. Radhabai Sarda Arts, Commerce and Science
College, Anjangaon Surji 444705, Maharashtra State, India^bDepartment of Physics, Arts, Science and Commerce College, Chikhaldara 444807,
Maharashtra State, India^aCorresponding author: -rbmankar@gmail.com**Abstract:**

In present work dipping method was employed for surface modification of SmFeO₃ thick films. SmFeO₃ thick films were fabricated on glass substrate by screen printing technique and fired at 500 °C for 30 min. As-prepared pure SmFeO₃ thick films were dipped into 0.1 M aqueous solution of Cobalt Chloride for 1 min and then fired at 550 °C for 30 min to obtain Co modified SmFeO₃ thick films. Structural and morphological properties of unmodified and Co modified SmFeO₃ thick films were investigated by Field Effect Scanning Electron Microscopy (FE-SEM) and Energy Dispersive X-Ray Analysis (EDS) techniques. The effect of cobalt doping on microstructure and surface morphology of pure SmFeO₃ thick film was discussed.

Keywords: SmFeO₃, Surface modification, Perovskite, Gas sensor, dipping technique.

RAMAN-38

Process Optimization of Plant Based Silver Nanoparticle Synthesis using Response Surface MethodologyHarshaSonaye ^{a,*}, VidyaSabale ^b^{a,b}DadasahebBalpande College of Pharmacy, Besa, Nagpur-440037, Maharashtra, India.^aTaywade College of Pharmacy, Koradi, Nagpur-441111, Maharashtra, India**Abstract:**

Nanoparticle research has sparked a lot of interest in recent decades, particularly in terms of developing more efficient techniques to synthesise them. The aim of the research is to study the plant mediated synthesis of silver nanoparticles using silver nitrate and plant extract concentration as a reducing agent. To get a high yield, processing parameters were statistically optimised. Response Surface Methodology was used to explore AgNPs and optimization (RSM). Based on the synthesis of AgNPs, which was measured using a UV-vis spectrophotometer at 390nm, the results suggest that all three parameters evaluated (AgNO₃, plant extract concentration, and stirring time) contributed considerably to the production. UV-vis analysis was used to characterize the synthesised AgNPs under optimal conditions.

Keywords: Silver nanoparticle, Response Surface Methodology

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RAMAN-39

Molar Concentration Dependent Capacitive Performance of Ultrasonic Spray Pyrolysed Ruthenium Oxide (RuO₂) Thin Films

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Abstract: Ultrasonic spray pyrolysis technique used for preparation of RuO₂ thin films on stainless steel substrate for different molar concentration (0.001-0.006 M) of RuCl₃.nH₂O as a precursor, dissolved in propanol medium. The decomposition temperature 723 K and volume 50 ml was kept constant for all depositions. All the deposited samples exhibit amorphous nature as indorses by XRD analysis. It was observed that the thickness of the materials strongly depends on the concentration of precursor solutions. Surface morphological evaluations like SEM elucidates the formation of continuous uniformity, structural homogeneity, interconnected granular morphology. The morphological outcomes reveals that the interconnected granular morphology offers large surface area for electrochemical activities as compared to dense, flat, bulky morphology. Wettability glimpses exhibit hydrophilic nature of all the deposits. Electrochemical studies of RuO₂ were carried out in 0.5 M H₂SO₄ electrolyte for all electrodes. Optimized RAM5 electrode shows 218 F/g SC at 2 mV/s scan rate. Achieved highest specific energy (SE) 65.77 Wh/Kg, power (SP) 98.61 KW/Kg and columbic efficiency (?) 89.82% respectively by charge-discharge method.

Keywords: Ultrasonic spray; Mesoporous (RuO₂), Supercapacitor; Energy and power.

RAMAN-40

Chromium Oxide Electrode Synthesized using SILAR Cycle Variations for Supercapacitive StudiesDr. A.V.Rajgure¹,Dr. D.R. Bijwe¹, Dr. P.S.Deole¹, V.R.Samhare¹, Y.D.Pardhi¹, S.R.Harde¹, R.G.Cobade², R.C.Ambare^{2*}
¹P.G. Dept. G.S.Tompe Arts, Commerce & Science College, Chadur Bazar Amravati, 444704, India.²Department of Physics, K.M. C. College, Khopoli-410203 (University of Mumbai), Maharashtra, India *author.e-mail: revanambare@gmail.com**Abstract:**

Today's one of the biggest challenges in front of the world to develop the environmentally friendly powerful energy and power storage device like Battery-Supercapacitor Hybrid (BSH). The present research investigates the chromium oxide nano-materials were synthesized using Successive Ionic Layer Adsorption and Reaction (SILAR) method. Thin film electrodes were synthesized using chromium nitrate as a ingredient dissolved in distilled water deposited for different deposition cycles variation. Prepared samples were annealed at 573 K in muffle furnace. Physical and electrochemical characterization of independent samples were studied by using XRD, SEM and CV, CP etc.

Electrochemical investigation of prepared samples was scanned by CV in 1 M KOH for different scan rates 1 to 100 mV/s. The obtained highest value of interfacial capacitance (IC) is 1.75 F/cm² at the scan rate 5 mV/s in 1 M KOH in the potential window -1.51 V to 0.83 V vs Ag/AgCl. By using chronopotentiometric technique, charge-discharge behavior of the optimized electrode was studied at different current densities (mA/cm²). Nyquist plot is used for the observation of internal resistance of the optimized electrode.

Keywords: SILAR; Thin Film; Electrode; Electrochemical characterization; Supercapacitor.

References:

- 1) R.C. Ambare, S.R. Bharadwaj, R. S. Mane and B. J. Lokhande. J. of Analytical and Applied Spray Pyrolysis, 132, (2018) 245-253.
- 2) R.C. Ambare, P. Shinde, U.T. Nakate, B.J. Lokhande, R.S. Mane Applied Surface Science 453, (2018), 214-219.

RAMAN-41

Study of structural, dielectric, ferroelectric properties and magnetodielectric Properties of Ni doped Ba_{0.95}Sr_{0.05}TiO₃ ceramicS.G. Chavan^a, P.S. Pise^a, A.C. Devkar^a, K.K. Dabane^a, S. D. Chavan^a, A.V.Rajgure^b, S.R. Jigjeni^c, A.N.Tarale^d, D.J. Salunkhe^{a*}^aNano-Composite Research Laboratory, Department of Physics, K.B.P. Mahavidyalaya, Pandharpur, 413 304, India.^bG.S.Tompe Arts, Commerce & Science College, Chadur Bazar Amravati, 444704, India.^cG.V.I.S.H. Amravati^dScience College, Pauni, Dist. Bhandara, 441910, India.

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Abstract:

In this present research work, the effect of influence of Ni substitution on the structural, dielectric, ferroelectric and magnetodielectric properties of single-phase Ba_{0.95}Sr_{0.05}TiO₃ (BST) ceramics. The hydrothermal method was employed to synthesis of the (BaSr)TiO₃ and Ni doped Ba_{0.95}Sr_{0.05}Ti_{1-x}Ni_xO₃, for x = 0.05, 0.1, and 0.15. The sintered pellets were characterized for their structural, morphological, dielectric, ferroelectric, and magnetodielectric properties. The X-ray diffractometer shows single phase crystalline structure. The critical temperature (T_c) decreases with increasing Ni doping concentration in BST. The P-E hysteresis loops confirm ferroelectric nature.

Keywords: Ni-(BaSr)TiO₃; Hydrothermal Synthesis; dielectric properties; MD Properties.

RAMAN-42

Analysis of Structure and Surface Morphology, Synthesis of Nickel Oxide Nanoparticles by Hydrothermal MethodSonuPatwa*, Dr. Hemant Kumar Singh¹, Navin Chaurasia²

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Abstract: Nickel Oxide (NiO) nanoparticle was synthesized by hydrothermal method by using Nickel Chloride Hexahydrate (NiCl₂·6H₂O) as the precursor. The synthesized precursor was calcined at 300°C for 4 hours. The XRD analysis result present that the calcined sample has a cubic structure and the average crystal size of around 18.02 nm achieved. The FTIR analysis result ensures the presence of functional group of nickel oxide. The UV analysis result presents the band gap of 3.8 eV. And the SEM analysis confirms the morphology.

RAMAN-43

EVALUATION OF BIOLOGICAL ACTIVITIES OF NANOCRYSTALLINE TETRAGONAL ZIRCONIA SYNTHESIZED VIA SOL-GEL METHODV.G. THAKARE¹, P.A. WADEGAOKAR²,¹ Department of Physics, Shri Shivaji College of Art's, Commence and science Akola, (MS), India² Department of Biotechnology, SGB Amravati University, Amravati (MS), 444 602 India
*(Corresponding author email: vaishaliwatile@gmail.com)**Abstract:**

Objective: The objective of the following study was synthesis of nanocrystalline tetragonal zirconia (ZrO₂) using simple sol-gel method and evaluation of its structural and biological properties. The sample was characterized by powder X-ray diffraction (XRD), Field Emission Scanning Electron Microscopy (FESEM), Evaluated for cell growth study using 3T3 mouse fibroblast cells. The XRD pattern shows that the tetragonal phase of nanocrystalline zirconia was obtained at relatively low temperature i.e. 300°C. The FESEM images showed that the prepared sample consists of particles in the range of 35-69 nm and homogenous particle size distribution. The sample of zirconia has excellent tissue biocompatibility, higher cell growth and does not shows the toxicity towards normal 3T3 mouse fibroblast cells. Nanocrystalline tetragonal zirconia show higher cell growth. Hence it can be used for various biomedical applications.

Keyword: Nanocrystalline Zirconia; sol-gel route; antimicrobial action; biomedical application

RAMAN-44**Syntheses of copper oxide nanoparticle by hydrothermal method and its structural & surface morphological studies**

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Abstract :

This research demonstrates a simple and versatile approach for producing copper oxide powder on a large scale. Copper oxide powder (CuO) was synthesized by the hydrothermal method using copper sulphate (CuSO₄.5H₂O) as a precursor material. According to the XRD study, copper oxide has a monoclinic crystal structure with a grain size of 23 nm. The resulting nano-CuO has an irregular homogenous shape, based on SEM analysis. FTIR spectroscopy at 1136 cm⁻¹ confirmed the presence of metal-oxygen (CuO) stretching vibrations in copper oxide nanoparticles. According to the UV-Vis investigation, the copper oxide nanoparticle exhibits an energy gap of 4.1 eV.

Keywords: Nanoparticles, Hydrothermal synthesis, Copper Oxide, Quantum confinement

RAMAN-45**Study of the Optical Constants of the Polymer Blends**

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Abstract:

The aim of the present work is concerned with the study of the optical constants of the PVC/PMMA blend at different ratio, were prepared with different concentration. The absorption spectra of PVC/PMMA blends at different concentration showed absorption changes in the wavelength range, which depends on the polymer type, and the concentration of the polymer blends. It was found that 50%PVC+50%PMMA ratio from these polymers showed higher

absorption values in comparison with the other blend. The absorption spectra have been recorded in the wavelength range (300-1400) nm. The absorption coefficient(?), extinction coefficient(k), refractive index(n) has been evaluated.

Keywords: Optical constants, Optical properties, PVC/PMMA blend.

RAMAN-46

Ionic Ratios of Groundwater in Northern part of Akola District, Maharashtra

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Abstract:

The present work is aimed at assessing various ionic relations of groundwater from northern part of Akola district, Maharashtra. The interpretations are based on a total of 55 samples each were collected in pre- and post-monsoon periods of the years 2006. Interrelationship plots of certain ions of groundwater are a significant tool to interpret sediment water chemistry, geochemical setup and weathering patterns. The scatter diagrams of $\text{Ca}+\text{Mg}$ vs HCO_3+SO_4 and Na vs Cl indicate the prevalent of silicate weathering.

Keyword: Source rock weathering and major ion composition

RAMAN-47

Effect of Sintering Temperature on Structural and Dielectric Properties of Lead Titanate

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Abstract:

Ferroelectric lead titanate (PbTiO_3) has been made by using wet chemical reaction method. Single-phase PbTiO_3 perovskite nanocrystalline powders were obtained by sintering at different temperatures 650°C , 700°C and 750°C for 4 hours. Synthesized powders of Lead Titanate PT (PbTiO_3) were subjected to X-ray diffraction [XRD] studies. XRD of the lead titanate reveals 29.66 nm, 25.90 nm and 25.15 at 650°C , 700°C and 750°C calcinations. As sintering temperature is increased, The PbO present in the material is vanished and pure phase PbTiO_3 is obtained. The influence of sintering temperature on structural and dielectric properties of the synthesized PbTiO_3 is discussed in this paper.

Key words: PbTiO_3 , Sintering, XRD, Dielectric properties.

RAMAN-48

VISCOMETRIC PROPERTIES OF AQUEOUS SODIUM SALT OF L-ALANINEM. B. Dhande^a, D. T. Tayade^b^a Department of Chemistry, HPT Arts and RYK Science College, Nashik-422005, India^b Department of Chemistry, Government Vidarbha Institute of Science and Humanities, Amravati, India

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Abstract:

Amino acid salts are considered as an attractive alternative to alkanolamine solvents for post combustion CO_2 capture from flue gases, due to their low volatility, stability towards oxidative degradation, higher surface tension and fast absorption rates. In this work, the viscosities of aqueous solutions of sodium salt of L-alanine were measured at 298.15 and 303.15K for concentrations range 0.01 to 0.15 mol L⁻¹. Furthermore, the Jones-Dole coefficient (B) and constant A were calculated from the experimental viscosity data.

Keywords: Sodium salt of amino acid; CO_2 ; viscosity; Jones-Dole coefficient.

RAMAN-49

Photoluminescent properties of Eu³⁺-doped NaMg(PO₃)₃ red emitting phosphor for WLEDs and display devices applicationsPrashant N. Parale^{1*}, Abhijeet R. Kadam², K. V. Dabre¹, S. J. Dhoble²

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Abstract:

A series of novel red-emitting Na_{1-x}Mg(PO₃)₃: x Eu³⁺ phosphors were successfully synthesized using the simple combustion method. The crystal structure, photoluminescence spectra, decay lifetime and quantum efficiency of the phosphors were investigated as a function of Eu³⁺ concentration. A dominant red emission peak centered at 612 nm along with an intense ^{5D₀→^{7F₄} transition at 699 nm indicates that Eu³⁺ occupies low symmetry sites in NaMg(PO₃)₃ host lattice, which was confirmed by Judd-Ofelt analysis. The crystallographic site-occupations of Eu³⁺ were investigated by the site-selective excitation and emission spectra in the ^{5D₀→^{7F₀} region, which indicates that Eu³⁺ ion in NaMg(PO₃)₃ prefers to occupy the crystallographic site of C₃ symmetry. The emission intensity is closely dependent on Eu³⁺ concentration with critical concentration of 8 mol %. NaMg(PO₃)₃: Eu³⁺ phosphor exhibits good thermal stability.}}

Keywords: Eu³⁺ ion; combustion synthesis; XRD; WLEDs; lamp phosphor.

RAMAN-50

Thermoluminescence studies of Dy doped ZnB₄O₇ phosphorKamlesh Thakkar¹, Ravi Sharma², Nameeta Brahme¹ and D.P. Bisen¹¹School of Studies in Physics and Astrophysics, Pt. Ravi Shankar Shukla University, Raipur (C.G.) India²Govt. Arts and Commerce Girls College Devendra Nagar, Raipur (C.G.) India

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Abstract:

Solid state reaction method was used to prepare the rare earth Dy³⁺ doped Zinc tetra borate phosphors. For the structural characterization of the prepared phosphors X-ray diffraction (XRD) technique was used. The diffraction pattern of the prepared samples is well matched with the standard XRD. The thermo luminescence glow curve was recorded for different UV exposure time. Maximum intensity of TL glow curve was obtained for 10 minutes UV exposure time. The TL intensity then decrease with increase in exposure time. The thermoluminescence glow-curves with different concentration of Dy³⁺ in zinc tetra borate (ZnB₄O₇) phosphors were studied. The thermoluminescence of the prepared samples with different heating rate was also observed. TL spectra also obtained.

Keywords: Zinc tetra borate, Thermo luminescence, Phosphors, XRD.

RAMAN-51

Photoluminescence Properties of Cs₂Ba(MoO₄)₂:Eu³⁺ Red Emitting PhosphorA.S.Khobragade^a, B.V.Tupte^b, D.H. Gahane^c^aDepartment of Physics, N.H.College, Bramhapuri (M.S.)- 441206, India.^bDepartment of Physics, SGM College Kurkheda(M.S.) - 441209, India.^cDepartment of Physics, N. H. College, Bramhapuri,(M.S.)-441206 India.

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Abstract:

Cs₂Ba(MoO₄)₂:Eu³⁺ phosphor (x=0.01, 0.03, 0.07 and 0.09 mole %) molybdate red phosphors had been synthesized using a combustion Method at as temperature 7600C and their photoluminescence characterization was performed. The excitation and emission spectra indicated that this phosphor could be excited successfully by the visible light, and then emitted red light with the peaks positioned at 615 nm. Upon 270 nm UV excitation, this phosphor shows characteristic fluorescence 5D₀ → 7F_J (J = 0, 1, 2, 3, 4) of the Eu³⁺ ions. The electronic transition located at 615 nm corresponding to 5D₀ → 7F₂ of Eu³⁺ ions, which is superior than the magnetic dipole transition located at 593 nm corresponding to 5D₀ → 7F₁ of Eu³⁺ ions. Concentration quenching has been observed for Eu³⁺ concentration 5 mole%. Eu³⁺ doped Cs₂Ba(MoO₄)₂ is a promising phosphor for applications in displays and optical devices.

Keywords: Combustion Method, Crystal Structure, Molybdates, Photoluminescence, Phosphor,

RAMAN-52

Thermal Decomposition Kinetics of VO(IV) and Zr(IV) Complexes of Hydrazone Schiff Bases

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Abstract: The thermal behaviour of VO(IV) and Zr(IV) complexes derived from different hydrazone Schiff bases was investigated by thermogravimetric analysis(TG). The thermodynamic analysis shows that the complexes lose hydrated and/or coordinated water molecules in the first step; followed by decomposition of ligand moiety in the further steps leading to formation of stable metal oxide. The decomposition steps were analyzed and the parameters like order of reaction(n), energy of activation (E_a), entropy change (ΔS), free energy change (ΔF) and apparent entropy (S*) were calculated by using Broido and Horowitz-Metzger methods. The activation energies values obtained in the two sets are in good agreement. Thermodynamic parameters: entropy (ΔS) and Gibbs free energy (ΔF) of activation were calculated using standard relations and discussed. On the basis of half decomposition temperature, the thermal stability of the complexes was determined.

Keywords: Salicyloyl hydrazone, Metal complexes, Thermal decomposition, Thermodynamic parameters.

RAMAN-53

Study of Structural, Magnetic and Dielectric properties of Calcium Substituted Ni ferrites

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Abstract:

Calcium-doped nickel ferrites with the composition $Ni_{1-x}Ca_xFe_2O_4$ ($x = 0.3$ and 0.9) are synthesized via microwave-induced sol-gel auto combustion method to analyze their structural, magnetic, and dielectric characteristics at extending frequency range. The X-ray diffraction (XRD) and transmission electron microscopy (TEM) were employed to analyze the prepared composition's nanostructure and exterior topography. The development of pure spinel ferrites is revealed by XRD patterns. The results demonstrate that as the calcium content in material increases, the lattice parameter of the Ni ferrite decline, as does the grain boundary. The saturation magnetization and coercivity of Ni-Ca ferrites decreased as the Calcium substitution raised. Due to the expanded boundary, the huge grains may have trapped pores within them, affecting the sample's density, resistivity, and dielectric constant. Following the Verwey hopping mechanism, the dielectric constant drops with increasing frequency.

Keywords: Ni-Ca ferrite, XRD, SEM, TEM, VSM, Saturation magnetization etc.

RAMAN-54

To Study the Impact of Concentration and Temperature on Intermolecular Interaction Between Dextrose and Electrolyte Solution.

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Abstract:

Densities and Ultrasonic velocity of Dextrose in electrolyte solution have been determined experimentally at 283.15K, 288.15K, 293.15 and 28.15K with different concentration. From these experimental data the Adiabatic compressibility (β_s), Acoustic impedance (Z), Intermolecular free length (L_f), Non-linearity parameter (β/A), will be calculated. The variation in concentration and temperature is useful in understanding the nature of molecular interaction in terms of physical parameters. On the basis of trends obtained for different parameter, it is cleared that there exist solute-solvent interaction shows greater molecular association through hydrogen bonding.

Keywords: Acoustic parameters, Adiabatic compressibility, Density, Dextrose and Ultrasonic velocity.

RAMAN-55

PHYSICO CHEMICAL ASSESMENT OF SOLI SAMPLES FROM RAMA (SAHUR) REGION, AMRAVATI DISTRICT, MAHARASHTRA (INDIA)M. P. Bhise^{1a} S. A. Athawale^{1a}, N. A. Junghare²^{1a-1a}Government Vidarbha Institute of Science and Humanities Amravati (MH) INDIA²MCT's Rajiv Gandhi Institute of Technology, Andheri (Waste) Mumbai (MH) INDIA

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Abstract:

The present study, deals with physico chemical assesment of soil samples from field which were collected from Rama village (Sahur). the study was primarily focused on testing of soil quality from various sampling stations. eleven representative samples were analyzed for its WHC, CaCO₃, pH, E.C., organic carbon, organic matter, Potassium, Sodium, Calcium, Magnesium.

Keywords: Physico-chemical, WHC, EC, OC, OM, Potassium, Sodium, Calcium, Magnesium

RAMAN-56

SOIL FERTILITY ENHANCEMENT: AN ACOUSTICAL APPROACH.Paritosh L. Mishra¹, Ajay B. Lad², and Urvashi P. Manik³¹Research Scholar, Department of Physics, Amolakchand Mahavidyalaya, Yavatmal, Maharashtra, India.²Department of Physics, Amolakchand Mahavidyalaya, Yavatmal, Maharashtra, India.³Department of Physics, Sardar Patel Mahavidyalaya, Chandrapur, Maharashtra, India.

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Abstract:

The fertility of the soil has great effects on nutrients availability to plants or crops to absorb nutrients. Because of low productivity problems in the non-fertile soils, fertilizers are applied to counteract the conditions which limit the plant absorption of nutrients. Thus the present work is aimed to understand the structural/molecular changes of solute (fertilizer) in solutions (water) which results in various solute-solvent, solvent-solvent, and ion-solvent interactions to find any way to increase soil fertility. These interactions depend on the nature of the solvent, size, and structure of the ion. For this purpose Ammonium Sulphate (AS) and Potassium Sulphate (PS) are being used which contain 46% of Nitrogen and 10.6% of Potassium. The numerous volumetric and acoustical properties depending on the temperature, concentration, and composition were calculated based on measured experimental data of density and sound velocity of Ammonium Sulphate (AS) and Potassium Sulphate (PS) molecules and water. The effect of different volumetric and acoustical parameters with changes in concentration and temperature were studied and the results were explored in terms of solute-solvent, solvent-solvent interactions, and structure making or breaking effects are of great importance in understanding the extent and nature of solutions.

Keywords: Acoustical properties, Density, Fertilizer, Intermolecular interaction, Sound velocity.

RAMAN-57

**TO STUDY THE POTENCY OF NEWLY SYNTHESIZED SUBSTITUTED
THIOCARBAMIDONAPHTHOL BY CONDUCTOMETRICALLY**

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Abstract: To foster more intensity drugs since microorganisms become more dynamic than past one. Numerous physicist and scientists has gotten an extraordinary consideration in the perspective on human powerlessness and insurance of conditions. According to the need of this age they combined many mixtures and particles and prime to evaluate their meanings and applications in different fields. Conductometric concentrate on got more qualities. Conductometric examination fostered an interconnecting join in the middle to substance science and life sciences. Consider above reality as a top priority present examination plot planned as to concentrate on the strength of 5-phenylthiocarbamido-1-naphthol at blended dissolvable media. In which decided the conductometric boundaries and thermodynamics boundaries of 5-phenylthiocarbamido-1-naphthol at various fixations and 310 K in 60% ethanol-water combination. Present work assists with understanding various associations like solute-dissolvable connection, solute cooperation, solute dissolvable collaboration and solute-dissolvable communication that are utilized in present work. This study assists with figuring out Pharmacodynamics of the recently integrated atoms.

Keywords: 5-Phenylthiocarbamido-1-naphthol, conductometric parameters, thermodynamic parameters and conductometric study.

Photoluminescence of Eu³⁺ Doped Strontium-Calcium Pentaboroaluminate (Sr_xCa_(6-x)B₅AlO₁₅) Phosphors

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Abstract:

Strontium calcium pentaboroaluminate phosphors were prepared via solid state synthesis. The all reagent was unit together to obtain a homogeneous mixture. After for 30 minutes, the precursor mixture was transferred to furnace pre-heated to anneal 5000C for 2 hrs. Then prepared phosphors were again re-annealed at 8000C for 4hrs. Remove the sample from the furnace after slow cooling having white crystalline floppy powder of Eu³⁺ Doped Strontium Calcium PentaBoroaluminate Phosphors.

All PL-Spectrum for various concentrations of Strontium-Calcium PentaBoroaluminate phosphor assigned due to the 5D₀' 7F₁ and 5D₀' 7F₂ transition of Eu³⁺ in red - orange region. The second one, is due to force electric dipole transition, first one occurs due to magnetic dipole transition.

In the near future as lighting sources, demand for new material with low energy consumption and Hg free lamps as lighting will increasing. The mercury free fluorescent lamp required excitation wavelength other than 254nm. The excitation of Eu³⁺ doped Strontium-Calcium PentaBoroaluminate phosphor is observed at 395nm. The PL emission peak at 596nm and 610nm in the red orange region of the visible spectrum after excitation of 392nm lights. PL emission of 596-610nm is due to the transition of Eu³⁺ located at 395nm. The excitation peak 395nm is near UV excitation and other than that of the conventional mercury excited lamp (254nm). Eu doped Strontium-Calcium PentaBoroaluminate phosphor may be useful for solid state lighting and lamp industry.

Keywords: Photoluminescence, long lasting, phosphorescence, boroaluminate

References :

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RAMAN-59

ULTRASONIC CHARACTERIZATION ON SOLUTION OF NIACINAMIDE IN AQUEOUS SODIUM SULPHATE

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Abstract: The Purpose of this paper is to Expose the Observable and Extraordinary Nature of Intermolecular Interaction in Niacinamide of Concentration (0.001N, 0.005N, 0.01N, 0.05N, 0.1N mol/kg) in the Aqueous Solution of Sodium Sulphate of (0.2 N & 0.5N mol/kg). The main Velocity and Density data for the said system were used to calculate the various Acoustical and Thermodynamic parameter in view to specify the Nature of Solute in the Solvent. These studies will help in View to investigate the tendency of structure Making and Breaking Effect, as well as Existence of a Significant Solute - Solvent Interaction.

Keywords: Niacinamide, Sodium Sulphate, Acoustical Parameter, Thermodynamic parameters, Ultrasonic Velocity.

RAMAN-60

MEASUREMENT OF THERMO-ACOUSTIC AND VOLUMETRIC PROPERTIES OF ZINC SULPHATE IN AQUEOUS SOLUTION OF MONOSACCHARIDE

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Abstract: Ultrasonic velocity and density measurement of Zinc Sulphate have been performed by ultrasonic interferometer technique in aqueous solution of monosaccharides (glucose) as a function of concentration (i.e. 0.2 and 0.5 Mole/kg) and temperature (i.e. 298.15K, 293.15K, 288.15K and 283.15K). The different acoustical properties have been explored from the density and ultrasonic velocity such as adiabatic compressibility, acoustic impedance, specific heat ratio, non-linearity parameter, relative association and isothermal compressibility. The result has been explained on the basis of association or dissociation exist between zinc sulphate and aqueous glucose solution or effect of structure making and breaking of solute in solvent.

Keywords: acoustical parameters, density, ultrasonic velocity and Zinc Sulphate.

RAMAN-61

Trends in the Technology of Radar Absorbing MaterialsP. R. Thote^{1*}, A. R. Bansod²

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Abstract:

This paper will discuss the different types of cutting edge materials being designed as radar absorbing materials (RAM). It will define the type of RAM and its general performance. I will discuss the plausible use of each material and provide details on what aspects must be improved or further researched. Overall a general path for future RAM will be proposed and discussed.

Keywords:- Radar Absorbing Material (RAM), Radar Cross Sections (RCS), United States Air Force (USAF), Halpern Anti Radar Paint (HARP), Radio Detection and Ranging (RADAR), etc.

RAMAN-62

ORGANIC INORGANIC METAL HALIDE PEROVSKITE SOLAR CELLSS. K. Bhonge^{1*}, A. R. Bansod²

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Abstract:

A revolutionary all-solid-state, hybrid solar cell based on organic-inorganic metal halide perovskite ($\text{CH}_3\text{NH}_3\text{PbX}_3$) materials has piqued academics' interest around the world and is rated one of the top ten scientific accomplishments of 2013. Because of its advantages, perovskite materials can be employed not only as a light-absorbing layer, but also as an electron/hole transport layer, and also because of its high extinction coefficient, high charge mobility, extended carrier lifespan, and long carrier diffusion distance, it has a very high extinction coefficient. The photoelectric effect. Perovskite solar cells' power conversion efficiency has increased from 3.8 percent in 2009 to 22.1 percent in 2016, making them more efficient than conventional solar cells. Perovskite solar cells are the best choice for a new generation of solar cells that will eventually replace traditional silicon solar cells. We detail the specific function of each layer in this study, as well as the development and process of perovskite solar cells. Concentrate on improving the function of such layers and their impact on cell performance. The methods of synthesis are then discussed. The performance features of the perovskite light-absorbing layer are discussed. Finally, the obstacles and hopes for the future are discussed. Perovskite solar cell development is also briefly discussed.

Keywords: Organic/inorganic perovskite, Mesoporous Structure, Plane Heterostructures, power conversion efficiency etc.

RAMAN-63

SYNTHESIS AND CHARACTERIZATION OF SOME 2-(SUBSTITUTEDTHIOCARBAMIDO) AMINOPHENOTHAIZINE

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A series of 2-(Substitutedthiocarbamido) aminophenothiazine (IIIa-c) was successfully synthesized by the interactions of 2-chlorophenothiazine(I) with various thiourea (IIa-c) in isopropanol medium respectively. The structure determination and justification of the synthesized compounds were done on the basis of elemental analysis, chemical characteristics and spectral

keywords: 2-Chlorophenothiazine, substitutedthioureas, isopropanol etc.

RAMAN-64

REFRACTIVE INDICES AND DENSITIES OF BINARY MIXTURES OF BENZENE-ETHANOL AND BENZENE-ACETONE AT ROOM TEMPERATURE

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Densities and refractive indices, of pure acetone, benzene, ethanol and their binary mixtures have been measured experimentally at room temperature. Molar refraction for the benzene-ethanol and benzene-acetone system was calculated theoretically. Experimental values and theoretical values of molar refraction were compared from these data. It has been suggested that the molar refraction is additive and constitutive property. Further, it is also observed that, the intermolecular interactions contribute nothing to molar refraction. Densities decreases as mole fraction increases suggesting that molecular interaction is weaker.

Keywords: Molar refraction, Refractive indices, Binary mixtures of benzene acetone and ethanol.

RAMAN-65

Molecular Interaction between the Monosaccharide and Salt Solution by Acoustical Approach

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Abstract: The different Thermo-acoustical properties have been investigated from the ultrasonic velocity & density measurement through ultrasonic velocity interferometer and 10 ml specific gravity density bottle. The sound velocity and density of monosaccharide (D-Glucose) in aqueous electrolytic solution (Magnesium chloride) provide valuable information regarding the ilk, strength of interaction and the formation of hydrogen bonds. The result is analyzed and explains on the basics of possible molecular interaction in term of structure -making and structure- breaking effects of monosaccharide in the aqueous solution of magnesium chloride at different temperature.

Keywords: Monosaccharide, electrolyte, thermo-acoustic property, intermolecular interaction.

RAMAN-66

"AN ACOUSTCAL STUDY TO EXPLORE THE INTERACTION BETWEEN DEXTROSE AND ELECTROLYTE SOLITION"

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Abstract:

The impact of solute in solvent has a great importance in to drug delivery in body as well as in nutrient uptake by plants from the soil. This will be studied by observing the tendency of structure making and breaking effect and their interactions by the introduction on of solute in solvent. In this work an attempt is made to evaluate the ultrasonic velocity and density for dextrose in 0.5mol/kg solution of aq. Potassium chloride. The different acoustical and transport properties of the given system using the sound speed and density of solute as well as solvent at different temperatures (viz. 283.15k, 288.15k, 293.15k, 298.15k).

Keywords: Acoustical Parameter, Density, Dextrose, Potassium chloride, Ultrasonic velocity, water.

RAMAN-67

**MOLECULAR INTERACTION AND THERMODYNAMIC PROPERTIES OF
POTASSIUM NITRATE AT VARIOUS CONCENTRATIONS AND TEMPERATURES BY
ULTRASONIC METHOD**

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Abstract:

In the present manuscript, we intend to examine the type of solute-solvent interactions present in such a system which is valuable to various sector. Systematic knowledge of the thermodynamic properties in conjunction with other volumetric properties provides useful information about water-solute interactions. We examine, therefore velocity, density, and viscosity of various concentrations of KNO₃ that have been measured in various aqueous solutions at 2MHz and 283.15K to 298.15K, to study the ion-solvent interactions. With the use of these experimental values desired thermodynamical and acoustical parameters such as available volume, ultrasonic attenuation, entropy, enthalpy, and L.J.P have been calculated.

Keywords- KNO₃, Acoustical parameters, ultrasonic velocity

RAMAN-68

**ULTRASONIC AND THERMAL STUDIES OF Al₂O₃ NANOFLUIDS AT
DIFFERENT TEMPERATURE: A REVIEW**

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Abstract:

Any Base fluids have low thermal conductivity and hence it has limited applications but when nanoparticles with high thermal conductivity incorporated into a base fluids then it can significantly enhance its thermal conductivity. While studying properties of any nanofluids, thermal conductivity is one of the key parameter which permits the use of nanofluids in various industries as a coolant or heat transfer applications. Thermal conductivity depends upon nanoparticles material, volume fraction, size, morphology, aspect ratio, base fluid thermo physical properties, temperature, and surfactant. Many researcher has reported that nanofluids shows higher thermal conductivity as compared to base fluids due to high surface area to volume ratio of nanoparticles and random motion of nanoparticles in dispersion medium. Many scientist have proposed various numerical and theoretical models. The current review includes the various synthesis techniques of Al₂O₃ nanoparticles and preparation of nanofluids for thermal investigations. Review show that when suitable metal nanoparticles and combination used, it increased the thermal conductivity of base fluids and opened wide range of applications for heat transfer purpose. This review will be useful for new researcher in the field of nanofluids.

Keywords: Nanofluids, Thermal conductivity, Measurement techniques, Theoretical models.

RAMAN-69**NOVEL SYNTHESIS OF 2-3 SUBSTITUTED QUINOXALINE & STUDY OF IT'S PHYSICAL PARAMETERS**

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Abstract :

Quinoxaline & its derivative is a privileged that has broad-spectrum applications in the various fields. The work emphasis on the synthesis of quinoxaline derivative, and evaluation of the physical properties like, conductance, spectrophotometric analysis, viscosity, density, solubility. etc was studied for quinoxaline in different solvents at different concentration.

Keywords : Quinoxaline, Conductance, Spectrophotometric, Viscosity etc.

RAMAN-70**SYNTHESIS OF 3-(4-SUBSTITUTED PHENYL)2- CHLORACTAMIDE AND ITS SOME PHYSICAL ASPECTS**

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Abstract :

The work emphasis on the synthesis the starting material amino acetophenone, dissolve in dichloromethane, in ice cold condition .Add potassium carbonate with stirring after complete addition chlorocetyl chloride was added drop-wise so that temp of reaction set maintained. After complete addition stir the reaction for hrs. at room temperature. Due to presence of pharmacophores hybrid molecule may act on different biological targets which may result in amplification of activity and evaluation of the physical properties like, conductance, viscosity, density, solubility. etc was studied for resulting compounds in different solvents at different concentration.

Keywords: Pharmacophores hybrid, Chlorocetyl chloride, Viscosity, Density, Solubility. etc

RAMAN-71**A Physico-Chemical and Thermo-Acoustical Study of Aqueous Potassium Sulphate at Different Temperature and Concentrations**

Pooja R. Sonune*, Urvashi P. Manik, Paritosh L. Mishra, Mohini G. Wankhade
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Abstract:

The experimentally determined quantity such as ultrasonic velocity, density and viscosity for aqueous potassium sulphate solution of various concentrations have been determined at different temperatures (288.15, 293.15 & 298.15K). These data have been used to calculate various thermos-acoustical parameters {viz. Free volume (Vf), Wada's constant (W), Hydration number (nH), Specific heat ratio (?), Relaxation strength (r), Solubility parameter (?), and Ballou's constant (B/A)²}. These all parameters proved the intermolecular interaction between solute (potassium sulphate) and solvent (water) and also observed the Physico-chemical behaviour of the solution. Thermo-acoustical studies could also be used successfully and well supported in this regard.

Keywords: Density, potassium sulphate, thermos-acoustical parameters, ultrasonic velocity, viscosity.

RAMAN-72**INTERMOLECULAR INTERACTION BETWEEN ASCORBIC ACID & SALT SOLUTION : A THERMO-ACOUSTICAL STUDY**

Rahul J. Raut¹, Urvashi P. Manik², Paritosh L. Mishra³, Pooja R. Sonune⁴
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Abstract :

The ultrasonic velocity, density of different concentration of ascorbic acid (Vitamin C) have been studied at various temperature. The measurement of ultrasonic velocity & density were carried out by using the ultrasonic digital velocity interferometer & 10ml specific gravity density bottle. By using this experimental data other thermo-acoustical relation like adiabatic compressibility, internal pressure, acoustic impedance, etc. have been calculated & studied. The aim of these study is to determine the geometry, nature, kind & strength of interaction of the liquid mixture. Such experimental data is helpful in pharmaceutical & food industries due to its wide application.

Keywords: Ultrasonic velocity, density, viscosity, ascorbic acid, sodium chloride, molecular interaction

RAMAN-73**Photodegradation Study of LDPE/PEG thin film**

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 India, Shri. Deorao Dada Junior Science college, Tiosa, India

Abstract :

Photodegradable plasticizer polyethylene glycol (PEG) is used as an additive for the enhancement of properties of LDPE in different weight percentage. This thin film (20-30 μ m thickness) sample of LDPE + PEG were prepared by solvent casting method. Exposure to UV light technique is used for 30 days. The structural properties were studied by XRD, FTIR and degradation was estimated by weight loss measurement before and after weathering the sample.

Keywords : photodegradation, LDPE, PEG, XRD, FTIR

RAMAN-74

Degradation studies of UV irradiated Polystyrene/ polyisoprene thin films.

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MooljiJetha College, Jalgaon, India.

Abstract :

Thin films of polystyrene/ polyisoprene composites of thickness 20 to 30 micron were prepared by solution evaporation technique. PS/PI thin films were exposed to UV irradiation of wavelength 280nm for varied time intervals. As synthesized thin films were characterized using weight loss method, X- ray diffraction (XRD), Fourier Transform Infrared (FTIR) spectroscopy and UV- Visible spectroscopy. The crystalline nature of films were found to be decreased and % of weight loss increases with varying time of irradiation.

Keywords : Polystyrene, PI, XRD, FTIR, and UV-Visible

RAMAN-75

A synthesis and fluorescence properties of trivalent Europium doped Yttrium Vanadate and YVO₄:Eu³⁺ @SiO₂ for biological applicationR. G. Korpe¹, K. A. Koparkar^{2*}, G. V. Korpe³, S. K. Omanwar⁴¹Department of Physics, Shri. Shivaji College of Arts, Commerce and Science Akola, 444001 India²Department of Physics, M. S. P. Arts, Science and K. P. T. Commerce College, Manora, Dist: Washim, 444404 India³Department of Chemistry, Shri. Shivaji Science College Amravati (MS) 444603, India⁴Department of Physics, S.G.B.A. University, Amravati (MS), 444602 India

Abstract : The red emitting Eu³⁺ doped YVO₄ phosphor were synthesized via co-precipitation method. The Core shell structured of Europium doped Yttrium Vanadate capped with SiO₂ was obtained by using TEOS (Tetraethyl Orthosilicate) to modified the biological properties. The structure confirmation and morphological properties of as-synthesized material were investigated by using powder X-ray diffraction (XRD) and Scanning electron microscopy (FE-SEM). The photoluminescence (PL) study of as-synthesized material were studied using spectrophotometer which reveals that intense red emission corresponds to 5D₀ -7F₂ transition of Eu³⁺ ions in the host lattice under the UV excitation. The biocompatibility of as-synthesized material shows the good potential for biological applications.

Keywords: Co-precipitation method; YVO₄:Eu³⁺@SiO₂; biological application; optical material.

RAMAN-76

Proximate and Nutritional Analysis of Leaves of Gmelinaphillippensis Cham.Nida S. Shaikh^a, Rahim S. Shaikh^b^a Department of Chemistry, Government Vidarbha Institute of Science and Humanities, Amravati (M.S.) 444604- India.^b Department of Chemistry, Institute of Science, Nagpur (M.S.), India.

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Abstract :-

The goal of this study is to carry out proximate analysis and to evaluate the nutritional profile of Gmelina phillippensis Cham., while mineral content was determined using an atomic absorption spectrophotometer. All the essential micro and trace metals were discovered in the leaves of G. phillippensis Cham. Potassium, calcium, iron, zinc, and magnesium were found to be present in it. The spectroscopic method identified and characterized all the major compounds that were of biological significance. Furthermore, the mineral content of G.phillippensis Cham. Leaves can be used as a supplement to combat malnutrition, particularly among rural folk, and the nutritional content can serve as an excellent source of natural antioxidants. Thus, numerous important minerals can be identified from the leaves of Gmelina phillippensis Cham.that have medicinal value.

Keywords:- Gmelinaphillippensis, Proximate analysis, Mineral content.

RAMAN-77

Behavior investigated as tunneling behavior of electrolytic solution using DC glow discharge.

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Abstract:

Phenomenon of discharge of electricity through the study of property of ionized gases has proved to be fruitful for the investigation. The dc glow discharge spectrometry is the most essential part of the electrical and spectral emission studies of the molecules, atoms and ions in the interface of solid and liquid. We measured the intensity of radiation emitted by dc glow discharge as a function of discharge current for the different electrolytes along with V-I characteristics. The voltage-ampere characteristics during a glow discharge in the atmospheric pressure gas using an electrolytic solution as the anode and metal electrode like tungsten as a cathode were carried out. Under the study of glow discharges of various elements, a monochromatic light at various wavelengths generated. Few species shows a change in the color of the glow when discharge current increased. We investigated negative resistance of solutions. This behavior investigated as tunneling behavior of electrolytic solution using DC glow discharge.

Keywords: glow discharge, interface, radiation intensity, tunneling.

RAMAN-78

The divergence of the laser beam emitted by this segment would have less angle of divergence because the plasma has less thickness.

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Abstract:-

The angle of divergence of output beam are different for Copper Vapour Laser and pulsed laser. The angle of divergence determine the photon flux when the beam is focused using focusing optics. Further the output beam is focused the diverging beam converges and get focused at the same point. In the present work, the analytical expressions are obtained for the peak power output of the CVL without mirror, the intensity of the laser radiation across the laser beam and peak power angle of divergence along the diameter of the discharge tube. The angle of divergence is determined by the absorption coefficients, initial inversion density and the dimensions of the laser plasma column in a direction perpendicular to the direction of propagation of the beam. The angle of divergence also increase with the dimensions of the plasma column in a direction perpendicular to the direction of propagation of the beam. From the calculation of peak power across the laser beam desired angle of divergence may be obtained. The half peak power angle of divergence for initial inversion density 0.2 and 0.4 are 20mrad and 30mrad respectively in Copper Vapour Laser.

Keywords: Copper Vapour Laser, laser radiation, inversion density, dimensions of the laser plasma.

RAMAN-79

Synthesis of some novel heterocycles from variously substituted chalcones by microwave irradiation and their medicinal assay

D. R. Deshmukh and Dr. R.D. Isankar
G.V.I.S.H. Amravati.

Abstract :

Variously substituted chalcones (I) have been converted into 1, 3, 5- tri substituted pyrazolines (III). These pyrazolines have been obtained by reacting chalcones (I) with isonoazide (2a) and thiosemicarbazide (2b) in stichometric proportion in microwave oven. The reaction mixture was irradiated with in microwave oven for 1 min at 150 watt. The yields obtain with these techniques are higher and purity of compound obtain is better as compare to classical method of synthesis. The structures of all these pyrazolines ?_ have been conformed on the basis of elemental analysis and spectroscopic data. These compounds were screened for their anti- microbial activity.

Key words :

Synthesis of 1.3.5- tri substituted pyrazolines, microwave irradiation, anti microbial testing.

RAMAN-80

Fabrication of Dye Sensitized Solar Cell and Study of Its Performance for Different Natural Dyes

Shantanu Raulkar & N R Pawar

Abstract:

For the preparation of dye 40 g of Beetroot and 40g of petals of palas were used . Palas was cut into small pieces and immersed in 30 ml ethanol. The beaker was sealed and kept for one hour, then the dye mixed ethanol was taken in a sample bottle and sealed. Same process was repeated for Beetroot . 0.005 g of rose Bengal was dissolved in 50 ml ethanol. Electrolyte solution was prepared by taking 0.1M Lithium Iodide and 0.05 M Iodine in acetonitrile. Magnetic stirrer was used for mixing the solution thoroughly. Two layers of scotch tape were applied as spacer on working electrode. Then two drops of electrolyte solution were added in the region of spacer and counter electrode was placed so that the working and counter electrode were placed facing each other. Then the slides were clamped together and contacts were taken out from it. In this way the cell is ready to test. Then it is characterized by XRD, Absorption spectra and some optical properties.

RAMAN-81

Ultrasonic velocity and other acoustical parameters of leaf extract solution of PsidiumGuajavain two different solvents: A comparative studyS. S. Kamble¹, S. R. Aswale², S. S. Aswale³¹Department of Chemistry, Arts, commerce and Science College, Maregaon-445303.³Department of Chemistry, LokmanyaTilakMahavidyalaya, Wani-445304.

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Abstract :

Ultrasonic Velocity, density, viscosity have been measured experimentally for the solution of leaf extract of PsidiumGuajavain two different solvents one is 50% ethyl alcohol and other is distilled water with various concentrations at 298.15 K, 303.15 K, 308.15 K keeping constant frequency of 4 MHz. As the acoustical parameters like adiabatic compressibility, intermolecular free length, relative association, relaxation time, specific acoustic impedance would prove to be more useful to predict and confirm the molecular interactions, these have been determined by measuring the Ultrasonic Velocity, density, viscosity of the prepared solution. A variation in these parameters will provide a strong information regarding the molecular interactions taking place in the solution. Ultrasonic velocity together with density and viscosity data will furnish a wealth of information about the interactions between ions, dipoles and hydrogen bonding. Here the study shows the different type of behavior of leaf extract used when solvents are different. This also supports that different kind of molecular interactions are taking place in different solvents.

Keywords : Ultrasonic velocity, Adiabatic compressibility, Intermolecular free length.

RAMAN-82

Preliminary Investigation of Phytochemical Constituents in Chloroform and Ethyl Acetate extracts of Andrographis Paniculata Plant.*R. P. Ganorkar^a, Y.S.Tamgadge^b and R.Y.Bakale^c^aDepartment of Chemistry, Mahatma Fule Arts, Commerce and Sitaramji Choudhari Science Mahavidyalaya, Warud, Dist. Amravati. 444906, (MS) India.^{b,c}Department of Physics, Mahatma Fule Arts, Commerce and Sitaramji Choudhari Science Mahavidyalaya, Warud, Dist. Amravati. 444906, (MS) India.

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Abstract :

Plant extracts continues the many examinations for more effective drugs of plant source which are less toxic and available for low socio-economic residents in the treatment of diseases caused by bacteria. Some phytochemicals have been used as poisons and others as traditional medicine. Well-known phytochemicals are the flavonoids, phenolic acids, isoflavones, saponins, carbohydrates, tannins and quinones. The aim of this study was to find out phytochemical analysis of extraction of Chloroform and Ethyl Acetate extracts of Andrographis Paniculata Plant have been calculated. The area was choose in Chikhaldara area, Dist-Amravati of Maharashtra State. Presence of Alkaloid, Carbohydrate, cardiac glycosides, Phenol, Phlobatanins, Flavanoids, Saponin, Tanin, Anthocyninine, Quinones, Terpenoids, Coumarine. Thus this plant can be utilise as an alternative source of useful drug.

Keywords: Chloroform and Ethyl Acetate extracts Phytochemical, Anthocyninine, Quinones, Terpenoids, Coumarine, Andrographis Paniculata.

RAMAN-83

Study of molecular interaction in various liquid mixtures by acoustical technique: A review

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Abstract:

The knowledge of molecular interactions between the atoms of any liquid or mixtures of two liquids is very much required for their several types of applications. There are several methods and tools available for explaining that how the atoms in a liquid mixture interacts with each other. In this review paper we have reviewed several research papers related to the study of molecular interactions. Here the authors of various research papers have used a very important technique known as the acoustical technique for which they have used the ultrasonic waves for study of molecular interactions. They have used the ultrasonic interferometer for the measurement of ultrasonic wave velocity. Density of liquid has been found by using the specific gravity bottle. For viscosity measurement, the Oswald viscometer has been used. By measuring the three parameters such as ultrasonic wave velocity, density of a particular liquid mixture and its viscosity, the several acoustic and thermodynamic parameters can be evaluated. This study helps a lot for understanding the molecular interactions in a particular sample. The various observed parameters have been explained in detail.

Keywords: Molecular Interaction; Ultrasonic Waves; Specific Gravity Bottle; Oswald viscometer; Liquid Mixtures

RAMAN-84

Synthesis and Physical properties of Mn doped KNbO₃ CrystalA. R. Khobragade^{1*}, A. R. Bansod²¹RajeDharamrao College of Science, Aheri, MS India²Dr. Ambedkar College Deekshabhoomi Nagpur

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Abstract: This study Ferroelectric ceramics have been synthesized from powders formulate from individual oxides also called mixed oxide process. The XRD studies are found to be very much important to find the lattice parameters. The XRD pattern of Mn doped KNbO₃ is exhibited here in the Fig. 3.2. The lattice parameters are determined as $a=4.0 \text{ \AA}$, $b=5.6 \text{ \AA}$, $c=5.7 \text{ \AA}$. It is orthorhombic structure.

Keywords: Ferroelectric ceramics, single crystals, orthorhombic.

RAMAN-85

Synthesis and thermal properties of Copper doped KNbO₃ crystalA. R. Khobragade^{1*}, A. R. Bansod²¹RajeDharamrao College of Science, Aheri, MS India²Dr. Ambedkar College Deekshabhoomi Nagpur

gmail;atulkhobragade01@gmail.com; ar.bansod@gmail.com

Abstract: This study Ferroelectric ceramics have been synthesized from powders formulate from individual oxides also called mixed oxide process. The XRD studies of the sample were carried out to determine the lattice parameters. The XRD studies revealed the lattice parameters of Cu doped KNbO₃ single crystals as $a=b=c=4.0214 \text{ \AA}$. With an cubic structure at room temperature. It actually deviates from the regular orthorhombic structure of KNbO₃.

Keywords: Cubic, Ferroelectric ceramics, single crystals, orthorhombic.

RAMAN-86

Green Synthesis of Iron nanoparticles and its characterization using Brassica oleracea var. capitata leaf extract

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Abstract:

Nanoscience is a vital area of science which deals with study of small dimensional particles. Nanotechnology is an interdisciplinary branch of science, which emphasizes the study of materials in nano range 1-100nm. Cabbage Brassica oleracea var. capitata is one of major winter leafy vegetable which belong to cruciferae family. The aim of present study is the synthesis of Fe nanoparticles through green synthesis using Brassica oleracea var. capitata extract. In the present investigation synthesized Fe nanoparticles analyzed by using ultraviolet-visible spectroscopy (UV) was initially to be identified formation Fe nanoparticles. Furthermore, Fourier-transform infrared spectroscopy (FTIR) analysis to be confirmed functional groups of Fe nanoparticles. Scanning electron microscopy (SEM) and Energy dispersive X-ray spectroscopy (EDS) shows the shape of Fe nanoparticles and quantitative evaluation of Fe and O elements in the prepared samples.

Keywords: Brassica oleracea var. capitata plant extract, Ultraviolet spectroscopy (UV), Fourier transform infrared spectroscopy (FTIR), Scanning electron microscopy (SEM), Energy dispersive X-ray spectroscopy (EDS).

RAMAN-87

The Fourier Transform Infra-Red Spectroscopical Analysis Of Andrographis Paniculata Plant Extracts.

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Abstract:

The sample of Andrographis Paniculata Plant have been studied Fourier Transform Infra Red Spectroscopical Analysis of extraction in distilled water, ethanol, ethyl acetate and chloroform have been studied. FT-IR spectroscopic analysis is one of such powerful techniques used as an effective tool in phytochemical group investigation by identifying and characterizing chemical bonds present in biological samples including plant parts. The presence of characteristic functional group ketones, Aldehydes, carboxylic acids, Nitro, Ester, Amines, Alkane, Ether and Amides are responsible for various medicinal property of Andrographis Paniculata Plant.

Keywords: Andrographis Paniculata, plant extract, FTIR, functional groups.

RAMAN-88

SYNTHESIS AND ELECTRONIC STUDY OF IRON NANOPARTICLES OF TRIGONELLAFOENUM-GRACEUM

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Abstract :

The use of natural materials and less hazardous or toxic materials for the synthesis of nanoparticles is known as green method. The present work deals with the synthesis of iron nanoparticles by greener approach. The electronic spectroscopic studies i.e. ultraviolet-visible spectroscopy and Fourier transform infra-red spectroscopic studies of iron nanoparticles of Trigonellafoenum-graceum were studied in this present research work.

Keywords: Ultraviolet-visible, Fourier Transform infra-red, Trigonella Foneum-Graceum, iron nanoparticles.

RAMAN-89

SYNTHESIS, STRUCTURAL PARAMETERS AND PHOTOLUMINESCENCE PROPERTIES OF ZnB4O7:Eu³⁺+NANOPHOSPHOR

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*Department of Physics, Kamla Nehru Mahavidyalaya, Nagpur 440024, India
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The solid state diffusion technique had been used to successfully synthesize the ZnB₄O₇:Eu³⁺+nano phosphor. The PL excitation spectra showed a wide band from 240 and 330 nm, with a maximum peak around 257 nm and several weaker excitation peaks within 240 and 340 nm. The O₂--->Eu³⁺+charge transfer transition in the Eu³⁺ doped ZnB₄O₇ phosphor was significant for broad band around 250-300 nm. The phosphor can be effectively excited with mercury as well as UV radiation, as shown by prominent excitation peaks at 257nm and 393nm. In the wavelength range of 580nm to 680nm, a series of emission peaks are observed, which correspond to the transitions of 5D₀-7F₁(orange emission), 7F₂(orange emission), & 7F₃ (red emission). The ZnB₄O₇:Eu³⁺+nanophosphor is a new red-orange colour emitting phosphor, according to the entire analysis of the emission and excitation spectra. The material's structural parameters and surface morphology were investigated using XRD and SEM.

Keywords: ZnB₄O₇, PL, XRD, SEM.

RAMAN-90

IOT Based Blood Glucose Measurement Using Optical Spectroscopy

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Abstract :

This paper propose a device for measurement of glucose concentration in the human blood non-invasively using optical spectroscopy and IoT technology. The objective is to enhance the current technology with which the medical practitioner can monitor and get the update of the patient's glucose level without physically present at the patient place. This monitoring method also raises the patient's awareness of their blood sugar level. When the glucose level of diabetic is beyond the acceptance range, the system notifies the user or doctor [1]. This device uses Near Infra-Red (NIR) spectroscopy, Arduino Uno and IoT technology to reduce the agony of diabetic patients by providing easy and continuous monitoring of blood glucose non-invasively. Measurement system is basically able to monitor diabetic patients and save some data about name, age and blood glucose level of patient for future use.

Keywords: blood sugar, Arduinio, optical spectroscopy, IoT

RAMAN-91

A study of Physico-chemical parameters of Thiazine

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Abstract:

Thiazine area group of heterocyclic organic compounds Thiazine was synthesized from chalcone and purity check by TLC the characterization of Thiazine was done by IR H1 H1-NMR and mass spectrometer and UV. Visible spectrophotometer .The physicochemical parameters of heterocyclic Thiazine such as density viscosity absorbance has been studied at different concentration temperature and solvent.

Keywords: Heterocyclic,density,absorbance,temperature,solvent etc.

RAMAN-92

Study of Stability of Boron Nitride Ethanol Base NanofluidsAnkit Chavhan¹, D. S. Chavhan² & N. R. Pawar¹¹Department of Physics, Arts, Commerce and Science College, Maregaon-445303, India²Department of Physics, Amolakchand Mahavidyalaya, Yavatmal-445 303, India²

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Highlights:

- o The stability of nanofluids are highly dependent on Brownian motion and specific surface area to volume ratio of the nanoparticles in nanofluids.
- o Boron nitrite nanoparticles were synthesized via sol-gel method.

Abstract:

The present paper reports the study of stability Boron Nitride (BN) Nanoparticles in ethanol Base Nanofluids. BN nano particles were synthesized by high chemical route method and its characterization has been carried out by X ray diffraction (XRD), Fourier transformed infrared spectroscopy (FTIR), SEM, etc. Formation of the compound confirmed by XRD pattern matched with the standard data available in JCPDS file. Nanofluids of BN in ethanol base fluid were prepared by two step method. Nanoparticles of BN are first produced as dry powders by chemical method. Then this powder has been dispersed into a fluid in the second processing step with the help of intensive magnetic force agitation, ultrasonic agitation, high shear mixing, homogenizing and ball milling. Suitable surfactants were used to enhance the stability of nanofluids. Average particle size has been estimated by using Debye-Scherrer formula. It was found to be 70 nm. Stability of Nanofluids related to the surface of nanoparticles and nanoparticle surfactant interactions. Material characterization of BN nanosuspension was studied by non-destructive technique at various concentrations.

Keywords: BN Nanoparticles; XRD; SEM; Stability of Nanofluids; Non-destructive technique

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- 9 Y. K. Park, E. H. Tadd, M. Zubris and R. Tannenbaum, 2005. Size controlled synthesis of alumina nanoparticles from aluminum alkoxides, *Materials Research Bulletin*, 40 (9), 1512.

RAMAN-93**Thermodynamic and Viscometric Study of Aminopyrimidine Derivatives in 80% DMF-Water Solvent**

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Abstract: Viscosity measurement of aminopyrimidine derivatives was carried out in different percentage of binary solvent mixture. The viscometric measurement of recently synthesized drug viz 2-Amino [4-(3-nitrophenyl) - 6-phenyl - 1, 6-dihydro] - 1,3-pyrimidine(LA), 2-Amino[4,6- diphenyl-1,6-dihydro]-1,3- pyrimidine (LB) were carried out at several variation in concentration of solute as well as variation in temperature. The value of coefficient A and B was calculated from Jones Dole equation. The viscometric and thermodynamic parameters free energy change(ΔG), enthalpy change(ΔH) and entropy change (ΔS) were also evaluated. The result obtained during this investigation have been used to compute molecular interaction either solute-solute or solute- solvent and structure/ breaking ability of component in binary solvent mixture.

Keywords: 2-Amino[4-(3-nitrophenyl)-6-phenyl-1,6-dihydro]-1,3-pyrimidine, 2-Amino [4,6- diphenyl-1,6-dihydro]-1,3- pyrimidine, Viscosity, Thermodynamic parameters, Molecular interaction.

RAMAN-94**Aurone: A Comprehensive Review on Synthesis and Physical Properties of the Interesting Natural and Emerging Synthetic Compound.**Chaware T.S.¹, Pinjarkar A.P.¹, Ingle G.B.¹, Dr. Kolhe S.V.¹

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Abstract:

Aurones constitute a subclass of naturally occurring compounds which are structurally isomeric to flavones, biogenetically related to chalcones, and are responsible for imparting beautiful yellow colors to some of the flower petals¹⁻⁴. Recent investigations have shown that these compounds have potent and promising biological activities, in some cases even more potent than chalcones and flavones⁵⁻⁷. The current research is focused on study the physical properties with experimental data such as density, conductance, absorbance etc. of synthesized Aurone.

Keywords: Aurones, flower petals, Solubility, Density, Conductance, Absorbance, etc

RAMAN-95

Determination of Stability Constant of Some Substituted 2-Oxo-2H-Chromene-3-Carbohydrazide Derivatives at 0.1 M Ionic Strength.P. P. Choudhari¹, P. R. Yawale², S. S. Ubarhande³, M. P. Wadekar⁴G. S. Tompe Arts, Commerce and Science College, Chandur Bazar, Maharashtra^{1,2,3}Government Vidarbha Institute of Science and Humanities, Amravati, Maharashtra⁴

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Abstract :

Stability constant of some substituted 2-Oxo-2H-Chromene-3-Carbohydrazide derivatives at 0.1 M ionic strength at 52°C is determined by pH metrically. Calvin Bjerrum titration technique are use to study proton ligand and metal ligand stability constant. In This work the interaction of ligands N-[(E)-1-(5-bromo-2-hydroxy-phenyl)ethylideneamino]-2-oxo-chromene-3-carboxamide N-[(E)-1-(5-chloro-2-hydroxy-phenyl)ethylideneamino]-2-oxo-chromene-3-carboxamide with metal ions Fe(III), Mn(II), Cr(III) and Ti(III). The log K1 and log K2 values are find out for simultaneous complex formation

RAMAN-96

Photoluminescence investigation of rare earth activated Li₂AlSi₂(PO₄)₄Eu³⁺ For WLEDs lighting applicationsR.G.Deshmukh¹ P.A Fartode² D.A.Sharma

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Phosphate (PO₄) phosphors are the potential candidate in the field of luminescent spectroscopy applications from several decades. In the proposed work Eu³⁺ activated Li₂Al₂Si₂(PO₄)₄Eu³⁺ phosphors have been synthesized via low temperature simple combustion method using urea as a fuel. Phase confirmation and crystal structure determination of proposed sample were confirmed by Reitveld refinement analysis. Vibrational features of these phosphors have been investigated by FT-IR analysis. Photoluminescence study of the proposed sample confirms the spectra in blue and yellow region. These are results confirms the Eu³⁺ activated Li₂Al₂Si₂(PO₄)₄Eu³⁺ phosphors are the potential candidate for WLEDs lighting applications.

Keywords: Luminescent, Rietveld, Refinement, Lighting

RAMAN-97

Study of stability of α -Alumina nanofluids in Ethanol base fluidsV. K. Jadhao¹ & N R Pawar²¹Department of Physics, B. B. Arts, N. B. Commerce and B. P. Science College, Digras-445 203, India²Department of Physics, Arts, Commerce and Science College, Maregaon-445 303, India

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Highlights:

- o The thermoacoustic parameters of nanofluids are highly dependent on specific surface area to volume ratio of the nanoparticles in nanofluids.
- o α -Alumina nanoparticles were synthesized via sol-gel ethanol.

Abstract:

The present paper reports the study of stability α -Alumina Nanoparticles in Ethanol Base Nanofluids. Nanoparticles of alpha alumina (α -Al₂O₃) was prepared via sol-gel method from Aluminum isopropoxide [Al (OC₃H₇)₃] and aluminum nitrate. The prepared α -Alumina Nanoparticles was characterized by X-ray diffraction (XRD), Scanning electron microscopy (SEM) and FTIR. Average particle size has been estimated by using Debye-Scherrer formula. It was found to be in the range of 20-30 nm. Nanofluids of α -Al₂O₃ in ethanol base fluid were prepared by two step method. The synthesized powder form of α -Al₂O₃ has been dispersed into ethanol fluid in the second processing step with the help of intensive magnetic force agitation, ultrasonic agitation, high shear mixing, homogenizing and ball milling. Suitable surfactants were used to enhance the stability of nanofluids. Material characterization of α -Alumina nanoparticles was studied by non-destructive technique at various concentrations.

Keywords: α -Al₂O₃ Nanofluids; XRD; SEM; Surfactants; Non-destructive technique**References:**

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RAMAN-98

Application of Graphene oxide- Cadmium oxide Nano composite as Photo catalyst in degradation of nitro benzene

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Department of Chemistry Govt. Vidarbha Institute of Science and Humanities Amravati

Abstract:

Graphene oxide based metal oxide nano composite act as a photo catalyst in various organic transformations and selective degradation of organic dye, act as a water purifying agent. In this work the synthesis of graphene oxide cadmium oxide nanocomposite was done and degradation of nitro compound dye was studied in visible region of electromagnetic spectrum using different concentration of dye and catalyst.

Keywords : Graphene oxide, cadmium oxide, nanocomposite, and nitrobenzene.

RAMAN-99

Green Synthesis and Characterisation of Copper Oxide Nanoparticles using Azadirachta indica (Neem Leaves)Dr. D. R. Bijwe*, Dr. A. R. Rajgure*, Dr.P. S. Deole*, N. G. Pokale*, G. P. Gorle*,
S. P. Desgmukh, D. A. Pund¹

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¹Department of Chemistry, R. R. Lahoti Science College, Morshi, Dist. Amravati(M.S.), India

Abstract:

The green Nanotechnology is generating interest in Researchers for the Synthesis of Nano Particle in simple, cost effective, less toxic and eco friendly manner. In this study CuO-NPS have been bio-synthesized with Azadirachta indica leaf extract. The formation of Nano particles was confirmed by UV-Spectra studies. In UV spectrum the peak was obtained at 213 nm. The average particle size of synthesized Nano particles confirmed by the XRD studies. The particles size of CuO NPs are found in different sizes of nm.

Keywords: Copper nanoparticles, X-ray diffraction, UV-vis spectroscopy

RAMAN-100**Green Synthesis and characterization of Mgo Nanoparticles By Uusing Neem Leaves**

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G. P. Gorle A. R. Bodkhe

Post Graduate Department of Physics G. S. Tompe Arts, Commerce and Science
College, Chandur Bazar, Dist.- Amravati (M.)

Abstract:

Nano Particle fabrication using plant extracts is an important alternative method because it is non-toxic, biocompatible and environmentally friendly. Synthesis of Mgo Nanoparticles by green synthesis using Neem leaves which can be easily used for various biomedical applications. In this study MgO Nanoparticles have been bio-synthesized with Neem leaf extract. The synthesized MgO nanoparticles was characterized using UV-vis spectroscopy, X-ray Diffraction (XRD) study was used to confirm the crystalline nature of the biosynthesized nanoparticles and confirm the crystal size of the nanoparticles as ----- nm.

Keywords: MgO nanoparticles, Neem extract, UV-Vis, XRD

RAMAN-101**Enhancement of Electrical Conductivity in PVA Film by Doping with Li⁺ ion**

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¹Department of Physics, Vinayak Vidnyan Mahavidyalaya, Nandgaon Khandeshwar, Amravati-444708, Maharashtra, India

²Smt. Shevantabai Kalmegh Arts and Science Junior College, Chausala, Anjangaon Surji, Amravati-444806, Maharashtra

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Abstract : The electrical characteristics of polyvinyl alcohol (PVA) films doped with different concentration of (0, 5, 10, 20 wt%) of LiClO₄ Salt were studied. The electrical conductivity for (PVA -LiCO₄) polymer electrolyte films as a function of the concentration inorganic lithium perchlorate (LiCO₄) salt at room temperature and the relationship of electrical conductivity for (PVA-LiCO₄) films of different concentration of LiClO₄ Salt with the temperature are calculated. It is found that electrical conductivity of polyvinyl alcohol(PVA) is increase with increasing LiClO₄ Salt content and also temperature. In temperature range 313-343 K, the conduction mechanism is due to carries excited into the localized states at the edge of the band. Pure PVA and (PVA + 5wt% LICO₄), (PVA + 10wt% LICO₄), (PVA + 20wt % LICO₄), polymer electrolyte films have been prepared by solution casting method. These films were characterized by X-ray diffraction technique for structural studies. In XRD pattern PVA shows broad peak at $2\theta = 19.84^\circ$. This diffraction peak reveals the semi-crystalline nature of PVA. The addition of LiClO₄ causes the decrease in the degree of the crystallinity and consequently the increase in the amorphicity of the material and its conductivity.

RAMAN-102

Preparation and Structural Characterization of Polyaniline doped Zinc Oxide nanocompositeKamlesh R. Banarse*, Pritesh J. Jadhao*, S.P.Yawale*, S.S. Yawale#, D. R. Bijwe¹

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Pre-IAS Training Centre,Amravati, India

¹Department of Physics, G. S. Tompe Arts, Commerce & Science College, Chandur Bazar,Dist.-Amravati (M.S.) India**Abstract:**

Polyaniline doped with Zinc oxide (ZnO) nanocomposites are prepared by using chemical oxidative polymerization method. Preparation is done in aqueous medium with ammonium persulphate as an oxidant at room temperature. ZnO with 25 wt % is used for preparing nanocomposite. Structural characterization of the prepared samples was done by X-ray diffraction (XRD) and Scanning Electron Microscopy (SEM) technique. Agglomeration of the crystals were seen. These materials are polycrystalline in nature. Amorphous structure with very fine particles is seen. ZnO nanoparticles are seen which are deposited on surface of PANI. A nanocomposite show greater crystallinity due to the addition of ZnO in PANI matrix as compared to pure PANI. The crystallite size of PANI-ZnO nanocomposite was estimated from X-ray line broadening using Scherer's equation and found around 30 to 60 nm. The X ray diffraction pattern shows that degree of crystallinity of PANI-ZnO composite is higher than that of PANI.

Keywords: Polyaniline; ZnO, XRD; SEM.

RAMAN-103

Recent Progress in vanadium based nanostructured material and their composites for supercapacitor applicationsAnil R. Somwanshi¹, Satish P. Mardikar², Santosh J. Uke²¹J. D. Patil Sangludkar Mahavidyalaya, Daryapur, Dist -Amravati, (MS), India, Pin 444602²Smt. R. S. Arts, Commerce and Science Mahavidyalaya, Anjangaon, Surji, Dist - Amravati, (MS), India, Pin 444705**Abstract:**

The vanadium based nanostructured material and their composites have gained tremendous attraction because of their unique physical and chemical properties and wide applications as electrodes for supercapacitor. In this review, the latest research progress of vanadium based nanostructured material and their composites as an electrode material for supercapacitor is introduced and discussed. Also, the recent development of vanadium based nanostructured material and their composites supercapacitor in regards with their electrochemical performance in solid and liquid electrolyte, high specific capacitance, high energy density and cycle life have been discussed in detail. Finally, the critical challenges and perspectives obligatory to be addressed for the future development of vanadium based nanostructured material and their composites for supercapacitor applications are presented.

Keywords: Vanadium, Nanostructured, Supercapacitor, Electrochemistry, Energy density, etc.**Corresponding authors:** Dr. Santosh J. Uke, (Email: phyuke@gmail.com), Satish P. Mardikar (mardikar.satish@gmail.com)

Presenting author: Dr. Anil R. Somwanshi.

RAMAN-104

Synthesis and thermal properties of fe doped KNbO₃ crystalA. R. Khobragade^{1*}, A. R. Bansod²^{1*}RajeDharamrao College of Science, Aheri, MS India²Dr. Ambedkar College Deekshabhoomi Nagpur

gmail;atulkhobragade01@gmail.com; ar.bansod@gmail.com

Abstract: This study Ferroelectric ceramics have been synthesized from powders formulate from individual oxides also called mixed oxide process. The XRD studies of the sample were carried out to determine the lattice parameters. The XRD studies revealed the lattice parameters of fe doped KNbO₃ single crystals The lattice parameters of Fe doped KNbO₃ single crystals are found as $a = 5.69195 \text{ \AA}$, $b = 3.96691 \text{ \AA}$ and $c = 5.71130 \text{ \AA}$. with orthorhombic structure.. It actually deviates from the regular orthorhombic structure of KNbO₃.

Keywords : Ferroelectric ceramics, single crystals, orthorhombic.

RAMAN-105

Morphometric Analysis using Remote Sensing and GIS of Bahiram Ka Sand River (Pili river) Basin Amravati District, Maharashtra

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Chandur Bazar, District Amravati - 444702

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Abstract :

The aim of this paper is to perform morphometric analysis of Bahiram Ka Sand River (Pili river) with the help of remote sensing and GIS. Morphometric analysis of the river catchment was done by using geospatial techniques. The morphometric analysis of a drainage basin and its stream channel system can be better achieved through the measurement of linear aspect of drainage network and area aspect of drainage basin. The linear aspects of the channel system are; Stream order (Su), Stream length (Lu) and Bifurcation ratio (Rb) and Areal Aspect of drainage basin placed on the evaluation of morphometric parameters such as drainage density (Dd), stream frequency (Fs), circularity ratio (Rc), texture ratio (T), form factor ratio (Rf), Constant channel maintenance (C) and elongation ratio (Re). The study area is a 5 order drainage basin. The drainage pattern of the area ranged from dendritic to sub dendritic and at places the drainage was structurally controlled by lineament.

Keywords: Morphometric analysis, Remote sensing, GIS, Bahiram Ka Sand River (Pili river) basin

RAMAN-106**Preparation and characterization of PS PMMA blend films.**

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Abstract: The polystyrene (PS) and polymethyl methacrylate(PMMA) blend can be considered a quite promising material for different medical, environmental and industrial applications such as antibacterial, biosensors, lens, electronic gates, transistors and photovoltaic devices etc. For the same, the thin films of PS-PMMA poly blend systems were prepared by using isothermal evaporation technique. The sample was characterized by XRD, SEM and FTIR.

Keywords: - PS-Polystyrene, PMMA-polymethyl methacrylate

RAMAN-107**Synthesis of Triazine Derivatives, their Metal Complex and study of Antimicrobial Activities**

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444604

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Abstract:

The present study focuses on the synthesis of triazine derivatives, prepared by using the conventional and microwave irradiation methods, its characterization and antimicrobial activity were studied. These types of derivatives might have special interest in coordination and medicinal chemistry. Triazine and their derivatives has found many applications in industry particularly for drug development and pharmaceutically applicable molecule. Microwave irradiation were carried out in less solvent which was affordable for the target product, obtained

good yield. Spectroscopic techniques such as Ultra violet radiation (UV), X-ray diffraction (XRD), ¹H NMR, Fourier Transform Infrared spectroscopy (FTIR) was carried out. Similarly newly synthesised compound has been tested for their microbial activity.

Keywords: Synthesis, microwave, triazine, Characterization, antimicrobial activity

RAMAN-108

Synthesis of Co(Fe_{1.95}Al_{0.05})O₄ by hydroxy co-precipitation method and its characterization for structural and magnetic propertiesA. N. Tarale¹, S.R Jigajeni², A. V Rajagure³ M.S. Khandekar⁴, L.P. Chikhale⁵¹Science College Pauni, Dist. Bhandara India-441910²Gov. Vidarbha Institute of Science and Humanities Amravati³G.S. Tompe Art, Commerce & Science College Chandur Bazar Dist. Amravati⁴Maharashtra Udayagiri Mahavidyalaya, Udgir, Dist. Latur⁵Vankatesh Mahajan Senior College, Osmanabad, Maharashtra

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Abstract :

The CoFe₂O₄ (CFO) is a well known ferrimagnetic and magnetostrictive material with inverse spinel cubic crystal structure. The magnetostrictive properties of CFO are enhanced by substitution of metallic binders such as Co, Mn, Ni, Ag, etc or by sintering temperature. The present paper discusses the synthesis of Al substituted CFO on divalent Fe site (CFAO) by hydroxide co-precipitation method. The CFAO is sintered at different sintering temperatures between 1100 and 1300°C. Further all CFAO samples were characterized for structural and magnetic properties. Single phase formation of polycrystalline CFAO was confirmed from the X-ray pattern. It is observed that the magnetic properties of CFAO changes with sintering temperature and time. The paper shows the comparative study of different samples of CFAO for its magnetostrictive properties also.

Keywords : XRD, Co-precipitation method, magnetostrictive properties

RAMAN-109

GREEN SYNTHESIS AND CHARACTERISATION OF COPPER AND NANOPARTICLE USING FICUS PANDA LEAF (MEHENDI) AQUEOUS EXTRACT.D. R. Bijwe¹, P.S. Deole¹, A.V. Rajgure¹, P.A. Mandale¹, N.C. Ingle¹¹DEPARTMENT OF PHYSICS, G. S. TOMPE ARTS COMMERCE & SCIENCE COLLEGE, CHANDUR BAZAR

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Abstract:

The method of generating nanoparticle here which is copper oxide is very unique and most importantly ecofriendly method. As it says, it is ecofriendly it means it is less hazardous than others technical and chemical methods. We don't have to deal with chemical substances. And because of that it is also a cheaper method to perform. The copper oxide nanoparticle is generated using 150 ml of ficus panda extract mixing it with 50 ml of copper acetate solution. After adding them together, leave it to set the precipitate to settle down. Then filter all the solution using filter paper. Then leave it to dry.

Keywords : XRD, Co-precipitation method, Green Synthesis

RAMAN-110

Synthesis and Characterization of Copper Oxide (CuO) Doped Conducting polymer PolyanilineM.N. Pawar*, D.R. Bijwe¹, P.S. Deole¹, A.V. Rajgure¹, S.N. Kavitkar¹, M.S. Khandekar²¹ G.S. Tompe Art, Commerce & Science College Chandur Bazar Dist. Amravati² Maharashtra Udayagiri Mahavidyalaya, Udgir, Dist. Latur**Abstract:**

In this present paper, Nano crystalline and bulk CuO are prepared by thermal decomposition of freshly prepared Cu(OH)₂. The PANi-CuO samples are prepared with 10 and 35 wt%. The structural changes of prepared composite materials were carried out by X-ray diffraction (XRD) tool.

Keywords:- PANI, CuO, XRD

RAMAN-111

Green Synthesis of Zinc Oxide (ZnO) Nanoparticles Using Ocimum Tenuiflorum Leaves

P.S. Deole, D.R. Bijwe, A.V. Rajgure, M.N. Pawar, K. H. Chauhan

P.G. Dept. of Physics G. S. Tompe Art, Commerce & Science College Chandur Bazar Dist. Amravati

Abstract: This contribution reports on the synthesis and characterization of ZnO nanoparticles synthesized by a completely green process using leaves of Ocimum Tenuiflorum plant as reducing agent in the synthesis of ZnO nanoparticles.

Green synthesis of nanoparticles represents an advance over other methods because it is simple, cost-effective, and relatively reproducible, and often results in more stable material. Prepared ZnO nanoparticles were characterized by X-ray diffraction (XRD) and (UV) Rays.

The average particle size is calculated as 28.08 nm by using Scherrer's formula.

Keywords: Ocimum Tenuiflorum, ZnO nanoparticles, Green synthesis, XRD, UV

RAMAN-112

Effect of Sr doped on LaCoO₃ Structural and Catalytic propertiesArchana B. Bodade*, Anjali B. Bodade¹, G. N. Chaudhari¹

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Abstract: LaCoO₃ and La_{0.6}Sr_{0.4}CoO₃ nanoparticles were synthesized via a sol-gel chemical process and the physicochemical properties of these composites were characterized by X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), and energy-dispersive x-ray spectroscopy analysis (EDAX). Further, these composites were evaluated for photodegradation activities towards MB dye under sunlight irradiation.

Keywords: La_{1-x}Sr_xCoO₃(LSCO), methylene blue (MB), oxygen evolution reaction (OER)

RAMAN-113**Bianchi Type-III Cosmological Model in Scalar Tensor Theory Gravitation**P.M.Lambat^{1*} A.M.Pund²

Department of Mathematics

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Abstract:

In this paper Brans-Dicke field equations in anisotropic Bianchi type –III space times in the presence of matter and radiation which are minimally interacting fields have been derived. Exact solution of the field equations using some conditions were obtained. This solution shows an anisotropic radiation model in Brans-Dicke theory. Physical and Kinematical properties of the model have been calculated.

Keywords: Bianchi type-III, Brans-Dicke theory, Two fluid.

RAMAN-114**Synthesis and characterization of KAIF_4 : $\text{Ho}^{3+}/\text{Yb}^{3+}$ upconversion phosphor**K. S. Janbandhu^{1,2*}, V. B. Pawade², S. J. Dhoble¹¹Department of Physics, R. T. M. Nagpur University, Nagpur 440033, India²Department of Physics, Laxminarayan Institute of Technology, R. T. M. Nagpur University, Nagpur 440033, India

*Corresponding author: kapiljanab@gmail.com

Abstract:

$\text{Ho}^{3+}/\text{Yb}^{3+}$ -doped KAIF_4 upconversion phosphor was prepared by precipitation method in ethanol at low temperature. X-ray diffraction study was carried out to confirm phase of the prepared phosphor. From XRD analysis, we confirm the tetragonal phase of the phosphor. Surface morphology of synthesized phosphor was studied by Scanning Electron Microscopy (SEM). Stretching and bonding of the sample was studied by FTIR spectroscopy. Upconversion luminescence (UCL) properties were studied under 980 nm NIR laser excitation. The UCL spectra shows green emission around 540 nm and a very weak red emission around 655 nm wavelength. The green emission corresponds to $5F_4, 5S_2 \rightarrow 5I_8$ transition and red emission corresponds to $5F_5 \rightarrow 5I_8$ transition. The results indicate that the synthesized phosphors have potential applications in optical displays, fingerprint sensors, lasers, bioimaging and other biomedical applications.

Keywords: UCL; SEM; FTIR; Imaging Technology

RAMAN-115**Investigation of Nonlinear I-V characteristics of nanocrystalline tin oxide**

[#]Balkhande V.M., Abdul Tantray, Raulkar K.B., Lamdhade G.T.

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Abstract:

Current versus voltage characteristics (I-V) of nanocrystalline tin oxide (SnO₂) has been investigated at various temperatures (from 50°C to 350°C) in air. The characteristics were measured by using Keithley 6487 voltage source cum picoammeter. The nanocrystalline powder of SnO₂ was prepared by the liquid phase method and samples were prepared via spray pyrolysis technique in the form of thin films on an optically plane and clean glass surface. X-ray diffraction studies showed a tetragonal rutile structure for the samples. Microstructural studies were performed with scanning electron microscopy. The nanocrystalline tin oxide exhibited nonlinear I-V characteristics of the current-controlled negative resistance type (NTC). The results show that the threshold field (break down) voltage is higher due to the formation of a tin oxide layer over the crystalline tin. It is also found that the threshold field increases with the decrease in grain size.

Keywords: I-V characteristics, nanocrystalline tin oxide, liquid phase, XRD, SEM

RAMAN-116**I-V characteristics of Cupric Oxide (CuO) thin film**

[#]Balkhande V.M., Abdul Tantray, Raulkar K.B., Lamdhade G.T.

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Abstract:

Cupric oxide (CuO), having a narrow bandgap of 1.2 eV and a variety of chemophysical properties, is recently attractive in many fields such as energy conversion, optoelectronic devices, and catalysts. Compared with bulk material, the advanced properties of CuO nanostructures have been demonstrated. Current versus voltage characteristics (I-V) of nanocrystalline cupric oxide (CuO) has been investigated at various temperatures (from 50°C to 350°C) in air. The characteristics were measured by using Keithley 6487 voltage source cum picoammeter. The nanocrystalline powder of cupric oxide (CuO) was prepared by the liquid phase method and samples were prepared via spray pyrolysis technique in the form of thin films. X-ray diffraction studies showed a monoclinic structure of CuO and no other peaks are observed. Microstructural studies were performed with scanning electron microscopy. The nanocrystalline cupric oxide exhibited nonlinear I-V characteristics of the current-controlled negative resistance type (NTC).

Keywords: I-V characteristics, nanocrystalline cupric oxide, liquid phase, XRD, SEM

RAMAN-117

One Step Synthesis of Nano crystalline MgO

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 Amravati, (M.S.)444602 India

*Corresponding author. Tel: (+91) 8788875060; E-mail: anubhavdaware@yahoo.com;

Abstract:

The present study illustrates that the characterization and co-precipitation method for synthesis of Magnesium oxide nanoparticles. The magnesium oxide nanoparticles were synthesized by using liquid phase method with large surface area in short reaction time at room temperature and this method is the simplest, cost effective, ecofriendly method. It is also probed for its effect on nanocrystalline size structure via XRD studies of MgO nanoparticles, The crystallite size determined by the Debye-Scherrer formula is 12.62nm. Then application for humidity sensors is studied.

Keywords: Co-precipitation, Magnesium Oxide, nanoparticles, electrical measurements.

RAMAN-118

To study thermal stability of nanocrystalline Titanium oxide

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Abstract:

Current versus voltage characteristics (I-V) of nanocrystalline Titanium oxide (TiO₂) has been investigated at various temperatures (from 50oC to 350oC) in air, measured by using a data acquisition system consisting of Keithley 6487 voltage source cum picoammeter. The nanocrystalline powder of TiO₂ was prepared by the liquid phase method and samples were prepared via spray pyrolysis technique in the form of thin films on an optically plane and clean glass surface. X-ray diffraction studies showed a , mostly as rutile and anatase phases which both of them have the tetragonal structures of TiO₂. Surface morphological studies were performed with scanning electron microscopy. The nanocrystalline Titanium oxide exhibited nonlinear I-V characteristics of the negative resistance type with thermal stability.

Keywords: Nanocrystalline Titanium oxide, XRD, FE-SEM, I-V characteristics, thermal stability

RAMAN-119

Investigate transport properties of metal oxide doped polyindole composites.

A. A. Dubey, G. R. Dhokane

Arts, Science and Commerce College, Chikhaldara, 444807, Maharashtra, India

Abstract :

This review article aims to shed light on transport properties of metal oxide doped polyindole composites. Most of the researchers suggested, metal oxide doped polyindole can be synthesized through co-precipitation method. Metal oxide doped indole monomer at the time of polymerization FeCl_3 will be used as oxidant for polymerization.

As synthesized composites were characterized by using XRD, FE-SEM and FTIR to study the structural and morphological study. The dc conductivity measurements were performed by two probe method. The thermo gravimetric analysis and differential thermal analysis (TG-DTA) and differential thermal gravimetric (DTG) techniques are used to investigate thermal properties.

Polyindole composite material is conducting polymer emerge in the past several decades as a trusted material due to its unique physical and electrical properties. Due to its high oxidation potential and less stability this new attempt will be helpful to find out metal oxide doped polyindole's transport properties which will be useful in photovoltaic materials.

Keywords: Polyindole; Conductivity; Metal Oxide.

RAMAN-120

Photovoltaic Response of TiO_2 Nanoparticle doped materialsD. J. Bhagat¹, G. R. Dhokane²¹Nehru Mahavidyalaya (Arts, Commerce and Science) NerParsopant, Dist. Yavatmal.²Arts, Science and Commerce College, Chikhaldara, 444807, Maharashtra, India.**Abstract :**

This review reported the photovoltaic response of TiO_2 nanoparticle doped materials studied by various researchers. On the structural, morphological, thermal, mechanical, and optical properties of such films were studied by Fourier transform infrared (FTIR) spectroscopy, X-ray diffraction (XRD), high resolution transmission electron microscopy (HRTEM), and thermal analysis like differential scanning calorimetry (DSC) and thermo-gravimetric analysis (TGA).

The literature survey suggests that TiO_2 nanoparticle doped materials are shown very low band gap. The literature survey suggests that TiO_2 nanoparticle doped materials low-cost, low toxic, most chemically stable and high efficient photovoltaic device for solar energy conversion.

Keywords: Photovoltaic; Nanoparticles; Titanium Oxide.

RAMAN-121

Combustion synthesis of CaAlBO₄: Eu³⁺ phosphor for solid state lightingR. T. Maske^{1*}, A.N. Yerpude¹, S. J. Dhoble²¹Department of Physics, N.H. College, Bramhapuri, Dist- Chandrapur -441206, India²Department of Physics, RTM Nagpur University, Nagpur -440033, India**Abstract :**

Solid state lighting technology has gained attention as a potential replacement for fluorescent and incandescent bulbs. The phosphors CaAlBO₄: Eu³⁺ have been prepared by the combustion method. The prepared phosphor were investigated by powder X-ray diffractometer (XRD) and photoluminescence (PL) technique. UV excited luminescence of the CaAlBO₄: Eu³⁺ was observed in the red and orange region of the spectrum due to Eu³⁺ ions. According to the photoluminescence results, the synthesized phosphors could be used in solid-state lighting devices.

RAMAN-122

Ultrasonic Velocity, Adiabatic Compressibility, Intermolecular Free Length and Other Acoustical Parameters of Leaf Extract Solution of Cymbopogon Citratus.

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³Department of Chemistry, Lokmanya Tilak Mahavidyalaya, Wani-445304.

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Abstract :

Ultrasonic Velocity, density, viscosity have been measured experimentally for the solution of leaf extract of Cymbopogon Citratus in 50% ethyl alcohol with various concentrations at 298.15 K, 303.15 K, 308.15 K keeping constant frequency of 4 MHz. As the acoustical parameters like adiabatic compressibility, intermolecular free length, relative association, relaxation time, specific acoustic impedance would prove to be more useful to predict and confirm the molecular interactions, these have been determined by measuring the Ultrasonic Velocity, density, viscosity of the prepared solution. A variation in these parameters will provide a strong information regarding the molecular interactions taking place in the solution. Ultrasonic velocity together with density and viscosity data will furnish a wealth of information about the interactions between ions, dipoles and hydrogen bonding. In the present study it is observed that ultrasonic velocity increases with concentration due to solvation process.

Keywords: Ultrasonic velocity, Adiabatic compressibility, Intermolecular free length.

Synthesis and characterization of pure and Mg²⁺ doped ZnS nanoparticles

Sandeep A. Waghuley, Nikita S. Korde *

Department of Physics, Sant Gadge Baba Amravati University, Amravati (MS), India-444602 E-mail address: nikitakorde3@gmail.com

Abstract :

In the present study, zinc sulphide (ZnS) nanoparticles were synthesized using simple chemical co-precipitation method. As-synthesized nanoparticles were compared by doping magnesium chloride (MgCl₂) in simple reaction between zinc chloride (ZnCl₂) and sodium sulfide (Na₂S). The prepared nanoparticles were confirmed using ultraviolet-visible (UV-Vis) absorption spectroscopy and X-ray diffraction (XRD) analysis. Moreover, from UV-Vis optical spectroscopy study, the band gap of the nanoparticles was determined. The particle size of as-synthesized pure and Mg²⁺ doped ZnS nanoparticles were calculated by Debye-Scherrer formula according to XRD spectra. Both the characteristics exactly match with each other from broad peaks of UV-vis and XRD spectra. The particle size of as-synthesized Mg²⁺-ZnS nanoparticles was found near about 4.3 nm.

Keywords: Nanoparticles; Mg²⁺ doped ZnS; UV-Vis spectroscopy; X-ray diffraction (XRD).

Nurturing Interdisciplinary Competencies for Innovations in Science

Dr. U. R. Kanerkar*, Dr. Y. M. Rajgure* and Dr. D. R. Bijwe**

*Dept. of Botany, G. S. Tompe Arts, Commerce and Science College,
Chandur Bazar

** Dept. of Physics, G. S. Tompe Arts, Commerce and Science College,
Chandur Bazar

Abstract :

The rise of collaboration in the life sciences and its effect on scientific work and knowledge has received little attention till the 19th century. Most important breakthroughs have resulted as research-based knowledge across physical sciences and engineering disciplines is brought together and applied to societal problems during 20th century. Though the 20th century witnessed major developments in physics research, its second half was marked by transformations in molecular biology. The contemporary era of biology commenced when mutually, a biologist and a physicist revealed the nature of the interactions holding together the strands of DNA in the famous double helix. The beginning of the field of molecular genetics lies in the ground breaking discovery of the double-helical structure of DNA. Scientific breakthroughs in the field of molecular genetics like human genome sequencing opening up avenues for genomic research, genetic regulation and development of treatment options using micro RNAs and other gene-editing tools, improvements in high-throughput screening techniques for early diagnosis of difficult-to-treat diseases, are few examples representing the major knowledge additions to the dynamic advancements in research.

The goal of merging expertise to tackle complex problems is not new, and there are many examples in which researchers from multiple disciplines have worked together to solve problems that are away from the scope of individual scientific areas. Now the inter-disciplinary approach of life sciences with physical sciences, mathematics, and engineering implicated that the 21st century belongs to the life sciences technological revolution. Since last two decades, the life sciences became the most collaborative field after physical, chemical and earth sciences. Collaboration is a key for innovation to solve complex problems. In a knowledge-technology society, using collective efforts to stimulate innovation is helpful within a range of settings, including in research, education, and individual career development. We must pay attention to building interdisciplinary competencies for collective creativity.

॥ जय सद्गुरुदेव ॥

रक्षित झेरॉक्स बुक्स पेन

सर्व शालेयपयोगी साहित्य उपलब्ध



प्रो.प्रा.

संदीप एस.येलोरकर

श्रीकृष्णाई कॉम्प्लेक्स गो. सी. टोम्पे कला वाणिज्य
व विज्ञान महाविद्यालय समोर, चांदूर बाजार

RAMAN
2022
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