



**TNSCST Sponsored**  
**National Seminar**



**TNSCST**

**On**

**Current Innovations & Future Perspectives in  
Nanoscience and Technology  
(NSNST-2019)**

**1<sup>st</sup> February, 2019**

***Seminar Proceedings***



***Organized By***

**Department of Physics  
Chikkanna Government Arts College**

(Affiliated to Bharathiar University, Coimbatore & NAAC Re-Accredited with 'B' Grade)

**Tiruppur– 641 602, Tamilnadu.**

**Phone: +91-421-2242152**

**<http://chikkannaphysics.wixsite.com>**

**Wab:[www.cgac.in](http://www.cgac.in)**

**Follow us:[www.facebook.com/physicschikkanna/](https://www.facebook.com/physicschikkanna/)**

## **IENT Publications**

*All rights reserved. No part of this publication may be reproduced or transmitted, in any form or by any means, without permission. Any person who does any unauthorized act in relation to this publication may be liable to criminal prosecution and civil claims for damages.*

**First published: 2019**



**Published by**

**IENT Publications.**

**Organized by**

**Department of Physics,**

Chikkanna Government Arts College, Tiruppur-641 602,

Tamilnadu, India.

**Souvenir committee**

**Dr. Haresh M. Pandya**, Editor.

**Mr. T. Venkatesan**, Research Scholar.

**Mr. P. Gowdhaman**, Research Scholar.

**Mr. S. Mohammad Imran, Mr. M. Mayilsamy**, PG Students.

**Mr. Vigneshkumar, Ms. R. Saranya**, PG Students.

*This book is meant for educational and learning purpose. The author(s) of book has/have been taken all reasonable care to ensure that the contents of the book do not violate any existing copyright or other intellectual property rights of any person in any manner whatsoever. In the event author(s) has/have been unable to track any source and if any copyright has been inadvertently infringed, please notify the publisher in writing for corrective action.*



# CHIKKANNA GOVERNMENT ARTS COLLEGE

(Affiliated to Bharathiar University, Coimbatore. Re-Accredited with 'B' Grade)

Tirupur – 641 602, Tamilnadu, Phone +91-421-2242152,

[www.cgac.in](http://www.cgac.in)



Dr. S. RAMAIAH M.Com, M.Phil, Ph.D.  
PRINCIPAL

30<sup>th</sup> January 2019



## Message from the Principal's Desk

It is a matter of great pride and happiness for the Department of Physics, Chikkanna Government Arts College, Tiruppur to organize the TNSCST sponsored **National Seminar on "Current Innovations & Future Perspectives in Nanoscience and Technology (NSNST-2019)"** on Friday - February 1, 2019. It is very heartening to see that the Department of Physics has grown in leaps and bounds over the years and made tremendous progress in all areas academic, extra-curricular as well as capacity building relevant to both Faculty and Students. The Department has achieved commendable milestones in also getting projects from various funding agencies, thus setting an ideal example for others to emulate in the college. Research activity in the Department also needs to be highly appreciated and encouraged from the large number of research articles published by the Department Faculty and participation of Students in National and International conferences and seminars.

I heartily congratulate Dr. Haresh M. Pandya, HOD-Physics/Convenor and V. Senthilkumar, Assistant Professor/Organizing Secretary in taking the right steps in Organizing the National Seminar. I hope that such a congregation will help all those who are involved in widening their horizons in Physics. I also express my deep sense of gratitude to the entire Physics Faculty and Research Scholars for their wholehearted involvement and co-operation in organizing such an event. I congratulate the hosts, thank the sponsors and extend a warm welcome to all the Participants as well as Research Experts from other institutions to this National Seminar.

Wishing everybody the very best in their future endeavours.

With warm regards,

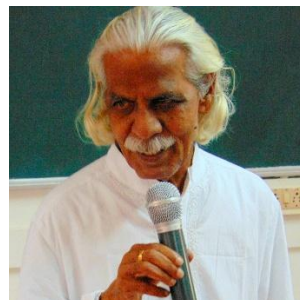
Dr. S. RAMAIAH

**Dr. ALAGAR RAMANUJAM**

Former Principal, NGM College,  
Pollachi, Coimbatore,  
Tamilnadu.

---

**29<sup>th</sup> January 2019**



### **MESSAGE**

I am happy to come to know that the Department of Physics, Chikkanna Government Arts College is organising National Seminar on “Current Innovations and Future Perspectives in Nanoscience and Technology” sponsored by TNSCST.

I am sure this seminar is a step in the right direction. Nanoscience is a fast growing field helping the practice of miniaturization in every scientific device. The challenge today before the nanotechnology is to give us much space and time as possible for the functioning process of any automatic device. There is much scope to discuss on this subject.

I wish the deliberations of the seminar a complete success for the speakers and audience.

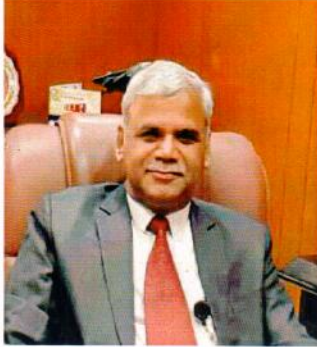


**Dr. Alagar Ramanujam**

---

डॉ. एम.यु.शर्मा, वैज्ञानिक 'जी'  
मुख्य कार्यपालक अधिकारी

**Dr. M.U. SHARMA Sc.'G'**  
Chief Executive Officer



सेमीकंडक्टर टेक्नोलोजी एण्ड अप्लाइड रिसर्च सेंटर  
(सितार की इकाई)

डि आर डी ओ, रक्षा मंत्रालय, भारत सरकार  
दूरवाणी नगर डाकघर, बेंगलूरु-५६० ०१६.

Semiconductor Technology and Applied Research Centre  
(A Unit of Sitar)

DRDO, Ministry of Defence, Govt. of India  
Doorvaninagar Post, Bengaluru - 560016.

January 30, 2019

## MESSAGE

Miniaturization of technology has become a trend in the last fifty years. Today, the feature size of transistors have reached size as small as 14 nanometers (nm) and development is also underway for chips that are merely few nanometers in size through the nanotechnology initiative.

The role of nanotechnologies is increasingly important in our society; their use has marked the beginning of a new era, from energy to environment, from medicine to building sector, from engineering to transport and telecommunications.

The role of academics is of utmost importance in the development of Nanoscience. Chikkanna Government College, Tiruppur has taken a nice initiative in this area by organizing a National Seminar on Current Innovations & Future perspectives in Nano Science and Technology i.e, NSNST 2019.

The Seminar will provide a technological platform for Students, Scientists, Researchers across the country to share their ideas and experience in the area of Nanoscience and Technology. Deliberations during this period will definitely help in future course of developments.

My best wishes to Dr. S Ramaiah, Principal CGAC, Dr. Haresh Pandya, Convenor NSNST and the organizing committee for organizing the seminar. I wish them all success.

**Dr. M U Sharma**  
Chief Executive Officer



# CHIKKANNA GOVERNMENT ARTS COLLEGE

(Affiliated to Bharathiar University, Coimbatore. Re-Accredited with 'B' Grade)

Tirupur – 641 602, Tamilnadu, Phone +91-421-2242152,

[www.cgac.in](http://www.cgac.in)



Mr. V. SENTHILKUMAR M.Sc., M.Phil.,

Organizing Secretary, NSNST-2019

Assistant Professor

Department of Physics

30<sup>th</sup> January 2019



## Organising Secretary's Message

### Warm Greetings from Chikkanna Physics!

The Department of Physics of Chikkanna Government Arts College, Tiruppur takes great pleasure in organizing a TNSCST sponsored One Day National Seminar on **“Current Innovations & Future Perspectives in Nanoscience and Technology (NSNST-2019)”** scheduled to be held on February 1, 2019. The objective of the seminar is to primarily provide an opportunity and platform for Research Scholars and Students for discussions, deliberations and interchange of ideas and results in the fields not restricted to Nanoscience and Technology.

Nanoscience & Technology is spoken of as the Buzz word today in scientific circles as it deals with science and engineering carried out in the nanometre scale. Even though the dimensions are small, the potential involved is high with endless possibilities and large scale emerging applications in diverse areas like drug delivery to treat tumour, cancer (without using radiotherapy & chemotherapy), solar energy, batteries, display technologies, opto-electronic devices, semiconductor devices in nanoelectronics, biosensors, CNT's etc., Nano composites, catalysis, and luminous paints etc., which can lead a Nation to wholesome industrial and technological growth.

On behalf of the Organizing Committee of NSNST-2019, I eagerly look forward to welcome all the Invited Guest Speakers and Research experts, Faculty as well as Students to witness and showcase their valuable research in the field nanoscience and technology. I also take this opportunity to thank TNSCST, Chennai for providing partial financial assistance to organize this event.

We greatly appreciate and value your active participation in this seminar and hope that this event will make sincere efforts to meet out your anticipations and expectations. Our sincere wish is that you carry rich remembrances of the event with you to cherish in the days to come.

Wishing you all the very best.

Mr. V. SENTHILKUMAR

Organizing Secretary, NSNST- 2019

251, College Road, Tirupur – 641 602, Tamilnadu.

Email: [physics.chikkanna@gmail.com](mailto:physics.chikkanna@gmail.com)

Mobile : +91-98654 61797

Web : [www.cgac.in](http://www.cgac.in)



**Dr. HARESH M. PANDYA** M.Sc., M.Phil., Ph.D.,

**30<sup>th</sup> January 2019**

*Convenor, NSNST-2019*

*Associate Professor & Head*

*Department of Physics*



### **Foreword by Convenor**

It is with deep satisfaction and happiness that I write this foreword to the Proceedings of the TNSCST sponsored National Seminar on “Current Innovations & Future Perspectives in Nanoscience and Technology (NSNST-2019)” organized by the Department of Physics of Chikkanna Government Arts College, Tiruppur, Tamilnadu India on February 1, 2019.

The Proceedings contain abstracts of 225 research papers received from academicians and research scholars from a variety of disciplines like Physics, Chemistry, Material Science, Computer Applications, Biotechnology and Engineering etc., around the central theme of the seminar namely Nanoscience & Technology. As organizers we are happy to present the proceedings as a published record of the National Seminar with a unique DOI Number. The authors of submitted papers come from almost all districts of Tamilnadu and cover a wide spectrum of topics.

Chikkanna Physics continues a lofty tradition of regularly bringing together researchers, academics and students from all over India to the college. We hope that this program will further stimulate a sustained culture of research activity amongst students, and provide better and safer ideas for furthering the growth of the Nation and the world together.

The seminar program represents the culmination of the efforts of many people. The event would have been literally impossible but for the timely financial support from TNSCST, Chennai as well as from many kind hearts. The encouragement received from our Principal and Chief Patron – Dr. S. Ramaiah has been exceptional. He has always extended full support to us in all our Department activities. Further, I thank all the members of the Scientific Advisory Committee particularly Shri V.V. Sridhar Guruji (Hyderabad), Dr. M U Sharma (SITAR-DRDO, Bangalore), Dr. Alagar Ramamujam, Mr Kandasamy (Majestic Exports, Tiruppur) and Prof. P.R. Kumar and Prof. P. Gopalakrishnan for being pillars of support in countless ways. Assistance from my ever cooperating Department Faculty, Dr. G.M. Nasira, Dr. S. Karthikeyan, Research Scholars and students has been outstanding. We thank all the authors for their contributions and their participation in NSNST 2019!

This event is become a reality thanks to the exemplary efforts put in by my colleague and friend Mr. V. Senthilkumar, Organizing Secretary NSNST-2019. He has been literally on his toes for the last one month.

Extending a warm welcome to all!

**Dr. HARESH M. PANDYA**

*Convenor, NSNST 2019*



TNSCST Sponsored **National Seminar** on  
“Current Innovations & Future Perspectives in Nanoscience  
and Technology (NSNST – 2019)”

1<sup>st</sup> February, 2019



## Local Organizing Committee

### Chief Patron

Dr. S. Ramaiah  
Principal



### Convenor

Dr. Haresh M. Pandya  
Associate Professor & Head



### Organizing Secretary



Mr. V. Senthil Kumar

### Organizing Committee



Dr. V. Annamalai



Dr. P. Peula Kumari



Mrs. V.A. Vijayageetha



Mr. J. William Charles



Dr. K.B. Rajesh



Dr. V. Senthilnathan



Dr. R. Balan



Dr. R. Sakthi Sudar Saravanan



TNSCST Sponsored **National Seminar** on  
“**Current Innovations & Future Perspectives in Nanoscience  
and Technology (NSNST – 2019)**”  
1<sup>st</sup> February, 2019



## **Invited Speakers**



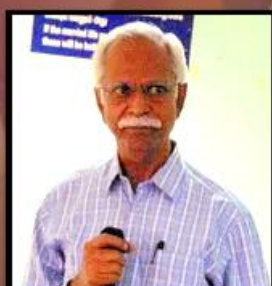
**Dr. Manoj U. Sharma**  
Scientist 'G',  
CEO at Semiconductor Technology  
and Applied Research Centre  
(DRDO),  
Bangalore.



**Dr. K. Srinivasan**  
Professor and Head,  
Department of Physics,  
Bharathiar University,  
Coimbatore-46.  
**Topic : An Overview of Crystal Concepts in  
Material Science**



**Dr. Alagar Ramanujam**  
Former Principal, NGM College,  
Pollachi.  
**Topic : Cosmological Perspectives of Nano  
Concept**



**Dr. P. Gopalakrishnan**  
Former Professor and Dean ,  
RVS College of Engineering &  
Technology,  
Coimbatore.



**Mr. K. M. Sathish**  
CEO, Arudhraha Infrastructures  
India, Coimbatore.  
**Topic : Opportunities for Technological  
Innovations in India Today**



*TNSCST Sponsored National Seminar on*  
**“Current Innovations & Future Perspectives in  
 Nanoscience and Technology” (NSNST-2019)**

**1<sup>st</sup> February 2019**

*Organized by,*

**Department of Physics,  
 Chikkanna Government Arts College,  
 Tiruppur 641 602, Tamilnadu, India.**



**Programme Schedule**

Time	Programme			
08:30 am to 9:45 am	Registration			
9:46 am to 10.45 am	Inaugural Function			
	Welcome Address : Dr. HARESH M. PANDYA Head & Associate Professor of Physics.			
	Organizing Secretary Address : Mr. V. SENTHILKUMAR Assistant Professor of Physics.			
	Presidential Address : Dr. S. RAMAIAH, Principal, CGAC, Tiruppur.			
	Inaugural Address : Dr. MANOJ U. SHARMA, Scientist 'G', CEO, Semiconductor Technology and Applied Research Centre, SITAR-DRDO, Bangalore.			
10:46 am to 11:00 am	High Tea			
11:01 am to 11:30 pm	Plenary Talk I			
	Speaker: Dr. K. SRINIVASAN Professor & Head, Department of Physics, BU, Coimbatore Topic : An Overview of Crystal Concepts in Material Science			
11:31 am to 12:00 pm	Plenary Talk II			
	Speaker: Mr. K. M SATHISH CEO, Arudhrah Infrastructures India, CBE Topic : Opportunities for Technological Innovations in India Today			
12:01 pm to 12.45 pm	Plenary Talk III			
	Speaker: Dr. ALAGAR RAMANUJAM Former Principal, NGM College, Pollachi. Topic : Cosmological Perspectives of Nano Concept			
12:46 pm to 01:15 pm	Paper Presentation (Oral)			
	Kumaran Hall	AV Hall	Physics Computer lab	I B.Sc Class Room
	Chair Persons: Dr. Alagar Ramanujam Dr. P. Gopalakrishnan, Dr. R. Balan	Chair Persons: Dr. G. M. Nasira Dr. L. Usha Dr. K. B. Rajesh	Chair Persons: Dr. K. Srinivasan Dr. S. Karthikeyan Dr. V. Senthilnathan	Chair Persons: Dr. Sivadhayanithi Dr. R. Sakthi Sudar Saravanan Mr. William Charles
01.16 pm to 2.00 pm	Lunch			
02:01 pm to 03:45 pm  Oral / Poster Presentation (Parallel Session)	Paper Presentation (Oral)			
	Kumaran Hall	AV Hall	Physics Computer lab	I B.Sc Class Room
	Chair Persons: Prof. D. Manivanan Mrs. Banupriya Dr. V. Annamalai	Chair Persons: Dr. Radhika Dr. M. V. Radhakrishnan Dr. P. Peulakumari	Chair Persons: Dr. Nishara Begam Dr. S. Karthikeyan Dr. V. Senthilnathan	Chair Persons: Dr. Priyadharshini Dr. V. Anitha Dr. Balan
	Poster Presentation (Venue: Open Auditorium)			
	Chair Persons: Dr. Manoj U. Sharma Mr. William Charles Dr. R. Sakthi Sudar Saravanan		Chair Persons: Dr. G.M. Nasira Dr. K. B. Rajesh Dr. V. N. Janakarajan	
03:46 pm to 04:00 pm	High Tea			
04:01 pm to 05:30 pm	Valedictory Function			
	Presidential Address : Dr. S. RAMAIAH,, Principal, CGAC, Tiruppur.			
	Valedictory Address: Dr. P. Gopalakrishnan Former Professor and Dean , RVS College of Engineering & Technology, CBE Vote of Thanks : Dr. HARESH M. PANDYA, Convenor NSNST-2019 Head & Associate Professor of Physics.			

## CONTENTS

S. No.	ABSTRACT ID	TITLE OF THE PAPER	PAGE NO.
<b>ORAL PRESENTATION</b>			
1	OP 01	METAL HALIDE PEROVSKITES: A NEW PARADIGM IN NEXT GENERATION NANOMATERIALS FOR PHOTOVOLTAICS -SAHAYA DENNISH BABU	1
2	OP 02	ELECTRON DENSITY, THERMO CHEMICAL AND ENERGETIC PROPERTIES OF HIGH ENERGETIC TNP MOLECULES VIA DFT AND AIM ANALYSIS - SRINIVASAN P	1
3	OP 03	ANTIMICROBIAL ACTIVITY OF PbS THINFILM BY CHEMICAL BATH DEPOSITION METHOD - ARULJOTHI C	1
4	OP 04	MODELLING OF A 250MHZ ST-X QUARTZ SAW DELAY LINE DEVICE FOR POTENTIAL SENSOR APPLICATIONS -BANUPRIYA R	2
5	OP 05	REINFORCEMENT EFFICIENCY OF MWCNTS ON POLYESTER/CARBON FIBRE NANO COMPOSITE - KARTHIKEYAN S	2
6	OP 06	ULTRASONIC BEHAVIOUR OF FEW ORGANIC TERNARY MIXTURES AT VARIOUS TEMPERATURES - EZHIL PAVAI R	2
7	OP 07	MECHANICAL CHARACTERIZATION OF AI - 2024 REINFORCED WITH LIME STONE AND GRAPHITE BY STIR CASTING METHOD – IYANDURAI N	3
8	OP 08	PARAMAGNETIC NATURE OF CD DOPED MNO NANOPARTICLES - K.PUSHPANATHAN	3
9	OP 09	SYNTHESIS, CHARACTERIZATION AND ANTIMICROBIAL ACTIVITIES OF COPPER OXIDE NANOPARTICLES FROM THE LEAF EXTRACT OF CYNODON DACTYLON - VELMURUGAN S	3
10	OP 10	SYNTHESIS AND CHARACTERIZATION OF NON-LINEAR OPTICAL CRYSTAL L-VALINE HYDROCHLORIDE - PRIYADHARSINI T.N	4
11	OP 11	EFFECT OF CADMIUM IONS ON THE STRUCTURE AND ELASTIC PROPERTIES OF B2O3 – BAO – MNO2 GLASSES - BALU L	4
12	OP 12	STRUCTURAL AND OPTICAL CHARACTERIZATION OF ZEOLITE POWDER SYNTHESIZED BY SOL-GEL TECHNIQUE - RENUGADEVI M	4
13	OP 13	SYNTHESIS AND LUMINESCENCE PROPERTIES OF K+ COMPENSATED CAMOO4: DY3+NANOPHOSPOR PREPARED VIA POLYOL METHOD- SURESHKUMAR A	4
14	OP 14	PARAMAGNETIC NATURE OF CD DOPED MNO NANOPARTICLES- S S GOMATHI	5
15	OP 15	ANTIBACTERIAL APPLICATION OF UNDOPED AND AL DOPED CDO NANOCRYSTALLINE THIN FILMS- RADHIKA V	5
16	OP 16	FACILE SYNTHESIS AND CHARACTERIZATION OF PURE AND CE, PB DOPED SNS NANOPARTICLES-JANANI K	5
17	OP 17	NANOCELLULOSE FROM BIOMATERIALS AND ANALYTICAL TECHNIQUES - YASODHA T	6

S. No.	ABSTRACT ID	TITLE OF THE PAPER	PAGE NO.
18	OP 18	SENSITIVITY ENHANCEMENT OF SURFACE PLASMON RESONANCE BIOSENSORWITH COPPER (CU) & TRANSITION METAL DICHALCOGENIDES (TMDCS) <b>MAHESHWARI P</b>	6
19	OP 19	FOCUSING PROPERTIES OF HYBRIDLY POLARIZED SINH GAUSSIAN BEAM THROUGH A DIELECTRIC INTERFACE - <b>LAVANYA M</b>	6
20	OP 20	GREEN SYNTHESIS OF COPPER NANOPARTICLES FROM BIOPHYTUM SENSITIVUM LEAF EXTRACTS AND THEIR ANTIBACTERIAL POTENTIAL APPLICATIONS- <b>SUNDARAMURTHY N</b>	7
21	OP 21	A SCIENTIFIC UPDATE ON NANOTECHNOLOGY - <b>VISWANATHAN K.K</b>	7
22	OP 22	AUTOMATIC FABRIC DEFECT DETECTION SYSTEM USING DIGITAL IMAGE PROCESSING AND ARTIFICIAL NEURAL NETWORK- <b>SAHAYA TAMIL SELVI S</b>	7
23	OP 23	CURRENT TRENDS OF NANOTECHNOLOGY FOR CANCER THERAPY- <b>SUDHA D</b>	7
24	OP 24	INTEGRATING NANOTECHNOLOGY INTO AGRI-FOOD SYSTEMS RESEARCH IN INDIAAGRICULTURAL NANOTECHNOLOGIES- <b>UMARANI T</b>	8
25	OP 25	OIL SPILL DETECTION IN NANOTECHNOLOGY USING IMAGE SEGMENTATION- <b>KAVITHA C</b>	8
26	OP 26	NATIONAL SEMINAR IN CURRENT TRENDS IN NANO TECHNOLOGY- <b>ANNAPOORANI S</b>	8
27	OP 27	CHOLINE ESTERASE BASED BIOSENSOR FOR THE DETECTION OF CADMIUM TOXICITY IN FRESHWATER FISH HETEROPNEUSTES FOSSILIS (BLOCH.) BRAIN- <b>RADHAKRISHNAN M.V</b>	8
28	OP 28	CURRENT INNOVATIONS AND FUTURE PERSPECTIVES IN NST- <b>UMASHANKAR R</b>	9
29	OP 29	PREPARATION AND ANALYSIS OF 0-3 CONNECTIVITY PZT-PVDF COMPOSITES BY VARYING PRESSURE AND POLING FIELD - <b>GAYATHIRI S</b>	9
30	OP 30	DENSITY FUNCTIONAL THEORY CALCULATIONS ON STRUCTURES, VIBRATIONAL FREQUENCIES OF 4-FLUORO-3-NITROANISOLE - <b>GOVINDARASU R</b>	9
31	OP 31	GREEN SYNTHESIS AND CHARACTERIZATION OF NI DOPED MGO NANOPARTICLES BY SOLUTION COMBUSTION METHOD USING ALOE VERA EXTRACT - <b>SUBATRA N</b>	10
32	OP 32	SYNTHESIS AND CHARACTERIZATION OF MG DOPED TIO2 MANO PARTICLES BY SOL GEL METHOD - <b>ANANN DHAKUMARI G</b>	10
33	OP 33	A DETAIL INVESTIGATION ON STRUCTURAL AND OPTICAL PROPERTIESOF ZNO:SN PREPARED BY CO-PRECIPIATION METHOD- <b>LEELAVATHI R</b>	10
34	OP 34	SYNTHESIS AND CHARACTERISATION OF RARE EARTH BASED NDMNO3 ELECTRODES FOR PEROVSKITE SOLAR CELLS- <b>SATHIYAPRIYA D</b>	10
35	OP 35	NANOTECHNOLOGY APPLICATIONS IN WATER TREATMENT- <b>BHUVANESHVARI B</b>	11

S. No.	ABSTRACT ID	TITLE OF THE PAPER	PAGE NO.
35	OP 35	NANOTECHNOLOGY APPLICATIONS IN WATER TREATMENT- <b>BHUVANESHVARI B</b>	11
36	OP 36	SENSITIVITY ENHANCEMENT OF SURFACE PLASMON RESONANCE SENSOR WITH NOBLE AND MAGNETIC MATERIAL (NI) COVERED 2D MATERIAL - <b>NISHA A</b>	11
37	OP 37	MAGNETORESISTANCE IN ELECTRODEPOSITED COBALT BASED ALLOYS: INFLUENCE OF MULTINARY ALLOY COMBINATION- <b>ANTONYRAJ K</b>	11
38	OP 38	MECHANICAL CHARACTERIZATION OF AL - 2024 REINFORCED WITH LIME STONE AND GRAPHITE BY STIR CASTING METHOD- <b>MUNIYAPPAN M</b>	12
39	OP 39	MODELLING OF A 350MHZ ST-X QUARTZ SAW DELAY LINE DEVICE FOR SENSOR APPLICATIONS- <b>DHIVYA K.S</b>	12
40	OP 40	PARAMAGNETIC NATURE OF CD DOPED MNO NANOPARTICLES- <b>MONISHA P</b>	12
41	OP 41	FABICATION OF DYE SENSITIZED SOLAR CELL OF ZNO NANOPARTICLES USING DIFFERENT NATURAL DYES- <b>SELVA ESAKKI E</b>	12
42	OP 42	A DETAIL INVESTIGATION ON STRUCTURAL AND OPTICAL PROPERTIESOF ZNO:SN PREPARED BY CO-PRECIPITATION METHOD- <b>VIJAYAN K</b>	13
43	OP 43	STRUCTURAL, MAGNETIC AND DIELECTRIC STUDIES ON BI1-XLAXMNO3 NANO CRYSTALLINE THIN FILM <b>VALLIYAMMAL K</b>	13
44	OP 44	SENSITIVITY ENHANCEMENT OF SURFACE PLASMON RESONANCE BASED BIOSENSOR USING COPPER-PLATINUM-TUNGSTEN DISULFIDE- GRAPHENE- <b>ALAGUVIBISHA G</b>	13
45	OP 45	PREPARATION AND CHARACTERIZATION OF NIMNCO3O4 THIN FILM FOR HIGH PERFORMANCE SUPERCAPACITOR ELECTRODE- <b>KALYANI M</b>	14
46	OP 46	SOL-GEL SYNTHESIS AND CHARACTERIZATION OF CU DOPED TIO2 NANOPARTICLES WITH ENHANCED OPTICAL AND STRUCTURAL PROPERTIES- <b>PRAMELA A</b>	14
47	OP 47	INVESTIGATION ON STRUCTURAL AND OPTICAL PARAMETERS OF BISMUTH OXIDE THIN FILMS- <b>KARTHIKADEVI K</b>	14
48	OP 48	BIOMEDIATED HYDROXYAPATITE NANOPARTICLES USING ACALYPHA INDICA LEAF EXTRACT FOR ANTIBACTERIAL ACTIVITY- <b>PRAVEENA J</b>	14
49	OP 49	SYNTHESIS OF COPPER OXIDE NANOPARTICLES USING THE MIXTURE OF PHYLLANTHUS AMARUS, CENTELLA ASIATICA AND ZIZIPHUS NUMMULARIA LEAF EXTRACT AGAINST ANTICARCINOGENIC ACTIVITIES- <b>BHUVANESVARAN L</b>	15

S. No.	ABSTRACT ID	TITLE OF THE PAPER	PAGE NO.
50	OP 50	GRAPHENE BASED SPR BIOSENSOR FOR SENSITIVITY EVALUATION- <b>KAVIYARASI K</b>	15
51	OP 51	DYE SENSITIZED SOLAR CELL WITH NATURAL DYE EXTRACT FROM BEETROOT- <b>POORINIDEVI T</b>	15
52	OP 52	PARAMAGNETIC NATURE OF CD DOPED MNO NANOPARTICLES- <b>KAAVIYA G</b>	16
53	OP 53	PROTECTING SENSITIVE DATA ON BIG DATA USING CRYPTOGRAPHIC ALGORITHM WITH QUANTUM PARTICLES- <b>VIMALA ROSELIN J</b>	16
54	OP 54	DIGITAL FORENSICS AND TEXT SENTIMENT ANALYTICS RETROSPECT ON SOCIAL MEDIA- <b>DEVIPRIYA K</b>	16
55	OP 55	A STUDY ON APPLICATIONS OF NANO TECHNOLOGY IN HEALTH AND MEDICINE- <b>KAVITHA P</b>	17
56	OP 56	NANO TECHNOLOGY IN MEDICAL IMAGING AND SENSING INSTRUMENTS- <b>CATHERINA S.MERLIN</b>	17
57	OP 57	A COMPREHENSIVE REVIEW ON ZINC SULPHIDE THIN FILMS BY CHEMICAL BATH DEPOSITION TECHNIQUES- <b>SHOBANA T</b>	17
58	OP 58	INVESTIGATION ON MICROWAVE SYNTHESIZED ZN(1-X)PBXS TERNARY ALLOY SEMICONDUCTOR NANOPARTICLES- <b>GOWDHAMAN P</b>	17
59	OP 59	INFLUENCE OF HEAT TREATMENT ON ZNO THIN FILMS FOR SOLAR CELL APPLICATIONS- <b>VALLIYAMMAL S</b>	18
60	OP 60	SYNTHESIS AND CHARACTERIZATION OF PURE AND NICKEL DOPED ZINC OXIDE NANOPARTICLES- <b>PREETHA M</b>	18
61	OP 61	MODELLING OF 100 MHZ SAW FILTER FOR A DIGITAL SIGNAL PROCESSING APPLICATIONS- <b>VENKATESAN T</b>	18
62	OP 62	ADVANCEMENTS IN THE DEVELOPMENT OF TIO2 PHOTOANODES AND ITS FABRICATION METHODS FOR DYE SOLLER CELL APPLICATION- <b>DEEPA R</b>	18
63	OP 63	STRUCTURAL, SURFACE AND OPTICAL PROPERTIES OF NANOSTRUCTURED HYDROXYAPATITE BUNDLES FOR PHOTODEGRADATION OF METHYLENE BLUE DYE- <b>JAIPRIYA S</b>	19
64	OP 64	SYNTHESIS AND CHARACTERISATION OF HYDROXYAPATITE NANO PARTICLES- <b>JAYARAM S</b>	19
65	OP 65	STRUCTURAL AND MORPHOLOGICAL CHARACTERIZATION OF TIN BASED TERNARY ALLOYS- <b>MOHANASRI M</b>	19
66	OP 66	STRUCTURAL AND ANTIMICROBIAL INVESTIGATIONS OF COPPER (II) CHLORIDE ADDED NANO-HYDROXYAPATITE- <b>NISHARA BRGUM A</b>	19
67	OP 67	DYE SENSITIZED SOLAR CELL WITH NATURAL DYE EXTRACT FROM ROSA DAMASCENA- <b>SHILPA D</b>	20
68	OP 68	SYNTHESIS AND CHARACTERIZTIONOF CUO THINFILM BY CHEMICAL BATH DEPOSITION METHOD - <b>METHUNAVATHANI P</b>	20

S. No.	ABSTRACT ID	TITLE OF THE PAPER	PAGE NO.
69	OP 69	SYNTHESIS,GROWTH AND CHARACTERIZATION OF GLYCINE DOPED WITH POTASIMUM CHLORIDE SINGLE CRYSTAL- <b>BHARATHI P</b>	20
70	OP 70	SYNTHESIS GROWTH AND CHARACTERIZATION OF L-ALANINE DOPED WITH CADMIUM ACETATE SINGLE CRYSTAL- <b>SINDHUJA R</b>	21
71	OP 71	FAULT DETECTION AND ANALYSIS OF TRANSMISSION LINE USING MATLAB SIMULINK- <b>ASHIPAPARVEEN A</b>	21
72	OP 72	STRUCTURAL SPECTROSCOPIC OPTICAL AND MECHANICAL STUDIES OF L-PROLINIUM TARTRATE CRYSTALS- <b>JANANI K</b>	21
73	OP 73	GREEN SYNTHESIS AND CHARACTERIZATION OF MGO NANOPARTICLES BY SOLUTION COMBUSTION METHOD USING ALOE VERA EXTRACT- <b>SHEEPA VERONICA J</b>	21
74	OP 74	A REVIEW ON CERAMIC-POLYMER COMPOSITE - <b>MYTHILY G</b>	21
75	OP 75	SYNTHESIS,GROWTH AND CHARACTERIZATION OF THIOUREA DOPED WITH POTASIMUM NITRATE SINGLE CRYSTAL- <b>SUNMATHI M</b>	22
76	OP 76	OPTICAL TRAPPING AND MANIPULATION OF MAGNETIC PARTICLES- <b>MOHAMED IMRAN S</b>	22
77	OP 77	MODULATING FOCAL STRUCTURES WITH PAIR OF VORTICES- <b>MAYILSAMY M</b>	22
78	OP 78	SYNTHESIS,GROWTH AND CHARACTERIZATION OF L-ALANINE DOPED WITH THIOPHENE SINGLE CRYSTAL- <b>NITHYA B</b>	22
79	OP 79	ADVANCED DEVELOPEMENT OF COMMUNICATION DEVICES USING RADIO FREQUENCY WAVES- <b>ARUNPRASATH S</b>	22
80	OP 80	CADMIUM SULFIDE NANOPARTICLES FOR LASER SAFETY DEVICES- <b>PRAKASH G</b>	23
81	OP 81	NANOSTRUCTURED ZINC OXIDE: SYNTHESIS AND CHARACTERIZATION FOR ANTIBACTERIAL ACTIVITY AGAINST ESCHERICHIA COLI- <b>VAIDHEESWARAN R</b>	23
82	OP 82	SYNTHESIS,GROWTH AND CHARACTERIZATION OF THIOUREA DOPED WITH POTTASIMUM CHLORIDE SINGLE CRYSTAL- <b>SATHYA R</b>	23
83	OP 83	ENERGY HARVESTING FROM CERAMIC AND POLYMER COMPOSITES- <b>RAMYA T</b>	23
84	OP 84	PREPARATION AND CHARACTERISATION OF CARBON QUANTUM DOTS FROM GLUCOSE AND TURMERIC POWDER- <b>NIVETH A</b>	24
85	OP 85	CLASSIFICATION AND TESTING OF SOIL TYPES FROM VARIOUS PLACES - <b>SONIYA DS</b>	24
86	OP 86	SYNTHESIS OF CARBON QUANTUM DOTS FROM NATURAL RESOURCES- <b>SUJITH KS</b>	24
87	OP 87	GREEN SYNTHESIS OF CADMIUM OXIDE NANO PARTICLE FROM SENNA AURICULATA- <b>SANTHIYA C</b>	24
88	OP 88	A STUDY OF PZT-PVDF COMPOSITE WITH PIEZOELECTRIC CHARACTERISTIC - <b>SARANYA R</b>	24

S. No.	ABSTRACT ID	TITLE OF THE PAPER	PAGE NO.
89	OP 89	SYNTHESIS AND CHARACTERIZATION OF CALCIUM OXIDE NANOPARTICLES BY CO-PRECIIPITATION METHOD- <b>GAAVIYAA SR</b>	25
90	OP 90	GROWTH AND CHARACTERIZATION OF SUCCINIC ACID DOPED L-THREONINE CRYSTAL- <b>SRIJA G</b>	25
91	OP 91	GROWTH AND CHARACTERIZATION OF TRIGLYCINESULPHATE (TGS) SINGLE CRYSTAL DOPED WITH NISO4- <b>DHARANI R</b>	25
92	OP 92	ENGINEERING SUB WAVELENGTH SCALE 3D FOCAL STRUCTURES USING SPECIALLY DESIGNED PHASE FILTER- <b>VETRIVEL R</b>	25
93	OP 93	INFLUENCE OF IN2O3 DOPANT ON THE PROPERTIES OF V2O5 THIN FILMS PREPARED BY VACUUM DEPOSITION ON ITO SUBSTRATES- <b>YUVARAJ P</b>	26
94	OP 94	STUDY OF CYCLONES ON SOUTH INDIAN REGION DURING 2010 – 2018- <b>PRIYADHARSINI M</b>	26
95	OP 95	SYNTHESIZE AND CHARACTERIZATION OF CU, NI DOPED ZNO NANOPARTICLES- <b>SYED VAJEEHA M</b>	26
96	OP 96	EFFECT OF ADIPIC ACID ON ELECTROCHEMICAL PROPERTIES OF LI3V2 (PO4)3 AS CATHODE MATERIAL FOR RECHARGEABLE LITHIUM-ION BATTERIES- <b>PRIYA A</b>	26
97	OP 97	STUDIES ON GREEN SYNTHESIS OF CARBON NANOPARTICLES USING MURRAYA KOENIGII SHOOTS- <b>SATHYAPRIYA N</b>	27
98	OP 98	NANOSATELLITE COMMUNICATION SYSTEM TRENDS- <b>FAIZALAHAMAD M</b>	27
99	OP 99	GREEN SYNTHESIS OF COPPER NANOPARTICLES USING OCIMUM SANCTUM AND PIPER NIGRUM- <b>NASREEN S</b>	27
100	OP 100	SYNTHESIS AND CHARACTERIZATION OF MAGNETIC MICROSPHERES LOADED WITH ANTICANCER DRUGS FOR DRUG RELEASE- <b>AJITHKUMAR C</b>	27
101	OP 101	PREPARATION AND CHARACTERISTICS OF SPIN COATED CDS THIN FILMS- <b>KALPANA K</b>	28
102	OP 102	BIOSENSORS IN NANOTECHNOLOGY- <b>NANTHINIDEVI S</b>	28
103	OP 103	BUCKYPAPER MADE OF CARBON NANOTUBES- <b>PRAVEEN M</b>	28
104	OP 104	ONE STEP SIMPLE HYDROTHERMAL SYNTHESIS AND CHARACTERIZATION OF RARE-EARTH MOLYBDATE (REMOO4) NANOMATERIALS FOR OPTOELECTRONIC APPLICATIONS <b>MAHAALAKSHMI P</b>	28
105	OP 105	NANOTECHNOLOGY AND ITS APPLICATIONS IN MEDICINE- <b>HITHESH D</b>	29
106	OP 106	FUTURE NANOTECHNOLOGY DEVELOPMENTS FOR AUTOMOTIVE APPLICATIONS- <b>SAMPATHKUMAR P</b>	29
107	OP 107	EVALUATION OF MODERN DIGITAL INTERACTIVE LEARNING STRATEGIES IN PRE GRADUATE STUDENTS USING DATA MINING ALGORITHM - <b>KOVALAN A</b>	29
108	OP 108	A STUDY ON COMPUTER MEMORY IMPROVEMENTS WITH NANOTECHNOLOGY - <b>S. JAYASANKARI</b>	30

S. No.	ABSTRACT ID	TITLE OF THE PAPER	PAGE NO.
<b>Poster Presentation</b>			
109	PP 01	DATA COLLECTION USING GROVE-PI SENSOR INTERFACE TO RASPBERRY-PI AND WIRELESS TRANSMISSION TO UBUNTU LAPTOP USING ZIGBEE- <b>RAGHAVENDRA M</b>	31
110	PP 02	GREEN SYNTHESIS AND CHARACTERIZATION OF HYDROXYAPATITE NANOPARTICLES- <b>KALAISELVI V</b>	31
111	PP 03	SYNTHESIS AND CHARACTERISATION OF INORGANIC ACID DOPED CONDUCTING POLYMER - <b>GAYATHRIDHANDAPANI D</b>	31
112	PP 04	NATURAL RADIOACTIVITY MEASUREMENTS ON RIVER SAND AND MANUFACTURED SAND IN CAUVERY RIVER BELT- <b>RAJKUMAR P</b>	31
113	PP 05	EXTRACTION PROFILE OF TI BY TBP-HNO <sub>3</sub> - <b>RAJALAKSHMI P</b>	32
114	PP 06	GROWTH AND CHARACTERIZATION OF IMIDAZOLE LITHIUM CHLORIDE (ILC) SEMI ORGANIC NONLINEAR SINGLE CRYSTAL - <b>ABINAYA R</b>	32
115	PP 07	SMALL ANGLE X-RAY SCATTERING IN THIN IRON FILMS- <b>ARUMUGAM G</b>	32
116	PP 08	PREPARATION AND CHARACTERIZATION OF CD <sub>2</sub> SNO <sub>4</sub> OF THIN FILMS BY USING JET NEBULIZER TECHNIQUE- <b>NASEEMA BANU S</b>	32
117	PP 09	EFFECT OF GAMMA RADIATION ON THE OPTICAL PROPERTIES OF INTERMOLECULAR HYDROGEN BONDED LIQUID CRYSTAL COMPLEX- <b>SUNDARAM S</b>	32
118	PP 10	PREPARATION AND CHARACTERIZATION OF CARBON NANOSTRUCTURES SYNTHESIZED BY USING LECHLANCHE CELL BATTERY CHEMICAL WASTE- <b>NEVETHA P</b>	33
119	PP 11	SPECTROPHOTOMETRIC DETERMINATION OF NITRATE ION IN THE PRESENCE OF CHLORIDE ION- <b>RAJALAKSHMI P</b>	33
120	PP 12	DESIGN OF BIO-NANOBOTS USING FUZZY MACHINE LEARNER WITH COLLABORATION OF NANO AND DATA MINING TECHNOLOGIES IN THE TREATMENT OF BREAST CANCER- <b>VIDYA R</b>	33
121	PP 13	PREPARATION OF NANOCRYSTALLINE YTTRIUM OXIDE PRECURSOR MATERIAL- <b>RAJALAKSHMI P</b>	34
122	PP 14	GROWTH AND CHARACTERISATION OF SN DOPED WITH TiO <sub>2</sub> THIN FILM PREPARED BY USING JET NEBULISER TECHNIQUE- <b>SENTHIL R</b>	34
123	PP 15	SYNTHESIS , SPECTROSCOPIC INVESTIGATION AND DFT STUDIES ON 2,5-BIS(4-HYDROXY-3-METHOXYBENZYLIDENE)- CYCLOPENTANONE- <b>MANIKAGANDAN G</b>	34
124	PP 16	RADIOACTIVE CHARACTERIZATION OF M – SAND AROUND CAUVERY RIVER BELT- <b>GNANA SARAVANAN S</b>	35
125	PP 17	NATURAL RADIOACTIVITY AND MINERALOGICAL CHARACTERIZATION ON RIVER SAND AND MANUFACTURED SAND IN CAUVERY RIVER BELT- <b>SENTHILKUMAR V</b>	35

S. No.	ABSTRACT ID	TITLE OF THE PAPER	PAGE NO.
126	PP 18	SURVEY ON NANO TECHNOLOGY- <b>SEETHALAKSHMI D</b>	35
127	PP 19	A CRITICAL REVIEW OF ECONOPHYSICS AND QUANTUM-LIKE APPROACHES IN FINANCIAL MARKET DYNAMICS MODELLING- <b>VINOD K</b>	36
128	PP 20	PREPARATION AND CHARACTERIZATION OF ELECTRODESPOSITED Ni-SiC COMPOSITE FILMS- <b>KARTHICK K</b>	36
129	PP 21	A SURVEY ON VOICE DISORDER FOR IDENTIFYING VOICE PATHOLOGY- <b>KOKILA P</b>	36
130	PP 22	FOCUSING PROPERTIES OF HYBRIDLY POLARIZED DOUGHNUT GAUSSIAN BEAM THROUGH A DIELECTRIC INTERFACE- <b>KAVITHA C</b>	36
131	PP 23	STRUCTURAL, ELECTRICAL AND OPTICAL STUDIES ON SPRAY-DEPOSITED ALUMINIUM-DOPED ZNO THIN FILMS- <b>RAJA M</b>	36
132	PP 24	CREATION OF MULTIPLE FOCAL SPOTS USING PHASE MODULATED RADIALLY POLARIZED DOUGHNUT GAUSSIAN BEAM WITH BINARY PHASE FILTER - <b>KARTHIKA T</b>	37
133	PP 25	CREATION OF AN ULTRA-LONG MAGNETIZATION NEEDLE GENERATED BY SUPER-RESOLUTION LONGITUDINALLY POLARIZED BEAM WITH A TERNARY OPTICAL ELEMENT- <b>UTHAYAKUMAR M</b>	37
134	PP 26	GROWTH AND CHARACTERIZATION OF EFFECT OF DYE ON THIOUREA NANO CRYSTALS FOR LASER APPLICATIONS- <b>PANIMALAR S</b>	37
135	PP 27	PHOTO CATALYTIC DECOMPOSITION OF PESTICIDE DICHLORVOS USING NANO CATALYSTS VIA GREENER ROUTE- <b>FRANKLIN EBENAZER A</b>	38
136	PP 28	CREATION OF MULTIPLE FOCAL HOLES SEGMENTS USING PHASE MODULATED AZIMUTHALLY POLARIZED DOUGHNUT GAUSSIAN BEAM WITH BINARY PHASE FILTER- <b>KARTHIK V</b>	38
137	PP 29	FOCAL SPLIT WITH TUNABLE FOCAL SHIFT OF CIRCULARLY POLARIZED ASYMMETRIC BESSEL MODULATED GAUSSIAN BEAM THROUGH A UNIAXIAL BIREFRINGENT CRYSTAL- <b>THIRUARUL D</b>	38
138	PP 30	PREPARATION AND CHARACTERIZATION OF MOO3 THIN FILMS BY SPRAY PYROLYSIS TECHNIQUE- <b>SATHISKUMAR S</b>	38
139	PP31	PROTON TRANSPORT IN GRAPHENE SHOWS PROMISE FOR RENEWABLE ENERGY- <b>SUBRAMANIYAN S</b>	39
140	PP32	DENSITY FUNCTIONAL THEORY APPROACH ON DYE DOPED KDP CRYSTALS FOR NON LINEAR OPTICAL APPLICATIONS- <b>RAJESHKUMAR S</b>	39
141	PP33	SYNTHESIS OF ZNS NANOPARTICLES BY CHEMICAL PRECIPITATION METHOD- <b>SELVANAYAKI C</b>	39
142	PP 34	INVESTIGATIONS ON BINARY MIXTURES FORMED BETWEEN METHYL MALONIC ACID AND BENZOIC ACIDS- <b>KAVITHA S</b>	39
143	PP 35	A REVIEW OF NANO STRUCTURED AL DOPED ZNO THIN FILMS PREPARED BY CHEMICAL BATH DEPOSITION METHOD- <b>JAYAPRIYA U</b>	40
144	PP 36	BINARY MIXTURES OF DOUBLE HYDROGEN BONDED LIQUID CRYSTALS- <b>MALATHI R</b>	40

S. No.	ABSTRACT ID	TITLE OF THE PAPER	PAGE NO.
145	PP 37	SYNTHESIS AND CHARACTERIZATION OF TERNARY ALLOYED CU <sub>0.5</sub> MN <sub>0.5</sub> S THIN FILM- <b>PRIYADHARSINI R</b>	40
146	PP 38	SYNTHESIS AND CHARACTERISATION OF COPPER OXIDE NANO PARTICLES USING MURRAYA KOENIGII AND INVITRO ANALYSIS- <b>JOTHIRAGAVI P</b>	41
147	PP 39	STRUCTURAL AND OPTICAL PROPERTIES OF CU <sub>2</sub> + AND NI <sub>2</sub> + DOPED ZNS NONOCRYSTALLINE THIN FILMS- <b>MYTHREYE P</b>	41
148	PP 40	IMPACT OF SOLAR ACTIVITY ON BACKGROUND RADIATION OF GOBI ARTS AND SCIENCE COLLEGE, GOBI CAMPUS- <b>KAVIPRIYA K</b>	41
150	PP 41	STUDY ON RADIO REFRACTIVE INDEX FOR WEATHER FORECASTING- <b>PRABHAVATHI A</b>	41
151	PP 42	HYDROTHERMAL SYNTHESIS AND CHARACTERIZATION OF CU <sub>2</sub> ZNSN <sub>4</sub> SE <sub>4</sub> CHALCOGENIDE NANOPARTICLES FOR SOLAR CELL APPLICATIONS- <b>GOKILAPRIYA S</b>	42
152	PP 43	COUPLING OF MODES MODEL OF A 150MHZ ST-X QUARTZ SAW DELAY LINE DEVICE FOR SENSOR SPECIFIC APPLICATIONS- <b>KOKILA S</b>	42
153	PP 44	A STUDY OF REMOTE SENSING SATELLITE DATA OF GREEN FOREST COVER IN TAMILNADU & KERALA DURING 2000-2015- <b>PARAMESHWARI R</b>	42
154	PP 45	GREEN SYNTHESIS OF ZINC OXIDE NANOPARTICLES BY USING MORINGA OLEIFERA LEAVES- <b>SANTHIYA R</b>	43
155	PP 46	A VARIOUS CHARACTERISTICS OF DIFFERENT CERAMIC-POLYMER COMPOSITE- <b>ARULPRAKASAM T</b>	43
156	PP 47	GRAPHENE BASED SPR BIOSENSOR FOR SENSITIVITY EVALUATION - <b>KAVIYARASI K</b>	43
157	PP 48	AN OVERVIEW OF ZEOLITES AND THEIR APPLICATIONS- <b>SANTHINI T</b>	43
158	PP 49	INVESTIGATIONS ON BINARY MIXTURES FORMED BETWEEN DOUBLE HYDROGEN BONDED LIQUID CRYSTALS- <b>SABEENADEVI P</b>	44
159	PP 50	SYNTHESIS AND CHARECTERIZATION OF ZINC OXIDE NANO PARTICLES UNING PEEL EXTRACT OF LUFFA ACUTANGULLA- <b>REKA S</b>	44
160	PP 51	A REVIEW OF CHARACTERIZATION AND PROPERTIES OF NAX-ZEOLITE- <b>SANGEETHA A</b>	44
161	PP 52	THEORETICAL STUDIES ON ELECTRON LOCALIZATION AND STRUCTURAL PARAMETERS OF DEXPANTHANOL AND PANTOTHENIC ACID- <b>SIVARANJINI P</b>	44
162	PP 53	PZT-PVDF COMPOSITE WITH PIEZOELECTRIC CHARACTERISTIC STUDIES- <b>VINOTHKUMAR G</b>	45
163	PP 54	INVITRO APPLICATION OF ZN DOPED CADMOUM OXIDE NANOPARTCLE AND ITS ANTIBACTERIAL ACTIVITY- <b>LAVANYA S</b>	45
164	PP 55	"SYNTHESIS AND CHARACTERIZATION OF WHEAT STARCH:POLY VINYL ALCOHOL: LICL BIODEGRADABLE GEL POLYMER ELECTROLYTE"- <b>MAKESHWARI C</b>	45

S. No.	ABSTRACT ID	TITLE OF THE PAPER	PAGE NO.
165	PP 56	EFFECT OF ANNULAR OBSTRUCTION ON TIGHT FOCUSING PROPERTIES OF AZIMUTHALLY POLARIZED DOUGHNUT GAUSSIAN BEAM- <b>GEETHA K</b>	46
166	PP 57	GENERATION OF 3D MULTIPLE FOCAL SPOT SEGMENTS BY ANNULAR WALSH FILTER- <b>PRAKASHRAJ V</b>	46
167	PP 58	PREPARATION OF CUO/SIO2 MICRO SPHERES- <b>MYTHILI RP</b>	46
168	PP 59	SYNTHESIS AND CHARACTERIZATION OF FE DOPED MANGANESE OXIDE NANOPARTICLES USING CHEMICAL PRECIPITATION TECHNIQUE- <b>VARSHAA S</b>	46
169	PP 60	A REVIEW ON NOVEL AUTOMATED SPRAY COATING OF TIO2 THIN FILMS- <b>JOTHIMANI PM</b>	47
170	PP 61	SYNTHESIS ,GROWTH AND CHARACTERIZATION OF L-ASPARAGINE MONOHYDRATE DOPED WITH THIOUREA A SINGLE CRYSTAL- <b>ENIYA MK</b>	47
171	PP 62	GREEN SYNTHESIS AND CHARACTERIZATION OF ZINC OXIDE NANOPARTICLE USING SESBANIA GRANDIFLORA LEAF EXTRACT AS REDUCING AGENT- <b>SWATHI T</b>	47
172	PP 63	THEORETICAL STUDIES ON MOLECULAR DESCRIPTORS AND NBO PROPERTIES OF DIHYDROXYASCORBIC ACID AND 5-1RD4T- <b>AMBIKA L</b>	47
173	PP 64	A REVIEW ON NOVEL AUTOMATED SPIN COATING OF TIO2 THIN FILMS- <b>VIJAYALAKSHMI P</b>	48
174	PP 65	EFFECT OF KINETIC ENERGY OVER STRUCTURAL PROPERTIES OF PECTIN AND QUINNIC ACID– A DFT STUDY- <b>MOHANADEVI V</b>	48
175	PP 66	GREEN SYNTHESIS OF ALUMINIUM NANOPARTICLES BY USING AERVA LANTA EXTRACT- <b>GOTHAVAI M</b>	48
176	PP 67	GREEN SYNTHESIS AND CHARACTERIZATION OF IRON OXIDE NANOPARTICLE USING SESBANIA GRANDIFLORA LEAF EXTRACT AS REDUCING AGENT- <b>KOKULAPRIYA E</b>	48
177	PP 68	OPTICAL AND THERMAL PROPERTIES ANALYSIS OF HYDROGEN BONDED LIQUID CRSYTAL BINARY MIXTURES - <b>GANESHAMOORTHY C</b>	49
178	PP 69	GROWTH AND CHARACTERIZATION OF CYCLOHEXYLAMMONIUM HYDROGEN MALEATE CRYSTALS FOR NONLINEAR OPTICAL APPLICATIONS- <b>GOMATHI R</b>	49
179	PP 70	THERMAL AND OPTICAL ANALYSIS OF HYDROGEN BONDED LIQUID CRYSTALS IN BINARY MIXTURES - <b>SARANYA P</b>	49
180	PP 71	GREEN SYNTHESIS AND CHARACTERIZATION OF ZINC OXIDE NANOPARTICLES BY USING AZADIRACHTA INDICA LEAVES- <b>MONISHA M</b>	49
181	PP 72	STRUCTURAL AND MORPHOLOGICAL CHARACTERIZATION OF SN-CO- FE TERNARY ALLOYS- <b>REKA M</b>	50
182	PP 73	SYNTHESIS,GROWTH AND CHARACTERIZATION OF GLYCINE AND THIOUREA DOPED WITH AMMONIUM ACETATE SINGLE CRYSTALS- <b>JAYASANKARI R</b>	50

S. No.	ABSTRACT ID	TITLE OF THE PAPER	PAGE NO.
183	PP 74	SYNTHESIS AND CHARACTERIZATION OF ZINC OXIDE NANOPARTICLES USING FLOWER EXTRACT OF CASSIA AURICULATA- <b>KARTHIKA K</b>	50
184	PP 75	SYNTHESIS , GROWTH AND CHARACTERIZATION OF L-ARGININE DOPED WITH THIOACTAMIDE SINGLE CRYSTAL- <b>MANJULA V</b>	51
185	PP 76	PREPARATION OF BIODIESEL FROM VARIOUS COOKING OILS- <b>ANANTHAPRIYA M</b>	51
186	PP 77	A REVIEW ON NOVEL AUTOMATED DIP COATING OF TiO <sub>2</sub> THIN FILMS- <b>MULLAI M</b>	51
187	PP 78	CHARACTERIZATION OF AB DIPPED SnO <sub>2</sub> THIN FILMS- <b>DHARANYA S</b>	51
188	PP 79	INVESTIGATION ON BIODIESEL FROM WASTE COOKING OILS- <b>NEETHU M</b>	51
189	PP 80	STRUCTURAL ACTIVITY AND TARGET PREDICTION ANALYSIS OF PELARGONIDIN AND PELARGONIDIN 3 O GLUCOSIDE- <b>SELVANAYAGI M</b>	52
190	PP 81	TIGHT FOCUSING PROPERTIES OF RADIALY POLARIZED DOUGHNUT GAUSSIAN BEAM THROUGH A DIELECTRIC INTERFACE- <b>SHARMILA G</b>	52
191	PP 82	STRUCTURAL ACTIVITY AND INSILICO ANALYSIS OF BIOCHANIN FLAVONOIDS – A THEORETICAL APPROACH- <b>AJITHKUMAR K</b>	52
192	PP 83	GREEN SYNTHESIS AND CHARACTERIZATION OF ZINC OXIDE NANOPARTICLE USING OCIMUM TENUIFLORUM LEAVES- <b>MAHESHWARI E</b>	52
193	PP 84	INVESTIGATIONS OF HYDROGEN BONDED LIQUID CRYSTAL BINARY MIXTURES- <b>VISWANATHAN R</b>	53
194	PP 85	NUMERICAL SIMULATION ON THE PERFORMANCE OF SPR BASED FIBER OPTIC SENSOR USING NANOCOMPOSITES- <b>ABIRAMAVALLI T</b>	53
195	PP 86	CUO NANOPARTICLES WITH SPONGY STRUCTURE- <b>REVATHI R</b>	53
196	PP 87	SYNTHESIS AND CHARACTERIZATION OF PURE AND Pb DOPED CDS THIN FILMS- <b>RAMKUMAR G</b>	54
197	PP 88	MPA CAPPED QUANTUM DOTS- <b>SUKITHA P</b>	54
198	PP 89	SYNTHESIS AND CHARACTERIZATION OF FEO NANOPARTICLES AND ITS ANTIBACTERIAL ACTIVITY- <b>VISHALATCHI M</b>	54
199	PP 90	QUANTUM DOT SOLAR CELL- <b>RENUGADEVI M</b>	54
200	PP 91	A REVIEW OF NANOSTRUCTURED Mg DOPED ZnO THIN FILMS USING CHEMICAL BATH DEPOSITION METHOD- <b>DEEPA N</b>	54
201	PP 92	GREEN SYNTHESIS OF ZINC OXIDE BY USING Hibiscus Rosa-SINENSIS- <b>NANDHINI S</b>	55
202	PP 93	SYNTHESIS OF CuO/SiO <sub>2</sub> CORE-SHELL NANOPARTICLES- <b>MONIKA S</b>	55
203	PP 94	AN INVESTIGATION OF ENERGY HARVESTING FROM PZT AND PVDF COMPOSITES- <b>SATHIYAPRIYA S</b>	55

S. No.	ABSTRACT ID	TITLE OF THE PAPER	PAGE NO.
204	PP 95	MODELING AND SIMULATION OF A 150MHZ ST-X QUARTZ SAW DELAY LINE DEVICE BY EQUIVALENT CIRCUIT MODEL FOR POTENTIAL SENSOR APPLICATIONS- <b>MOHANAPRIYA V</b>	55
205	PP 96	SYNTHESIS AND CHARACTERIZATION OF ZNO NANOPARTICLES AND ITS ANTIBACTERIAL ACTIVITY- <b>ISWARYA N</b>	56
206	PP 97	SYNTHESIS AND CHARACTERIZATION OF RICE STARCH: POLY VINYL ALCOHOL: LICI BIODEGRADABLE GEL POLYMER ELECTROLYTE- <b>SREE ARTHI S</b>	56
207	PP 98	SYNTHESIS AND CHARACTERIZATION OF NiO.5Cd0.5O NANOPARTICLES BY CHEMICAL PRECIPITATION METHOD- <b>MATHIPRIYA N</b>	56
208	PP 99	INVESTIGATION OF IRON OXIDE NANOPARTICLES USING FICUS CARICA DRIED FRUITS AND ANTI BACTERIAL ACTIVITY- <b>SUMI PK</b>	56
209	PP 100	HYDROGEN BONDED LIQUID CRYSTALS: BINARY MIXTURES- <b>MANIMEKALAI S</b>	57
210	PP 101	GREEN SYNTHESIS OF CADMIUM NANOPARTICLES FROM HIBISCUS SABDARIFFA FLOWER EXTRACT- <b>PRIYADHARSINI N</b>	57
211	PP 102	IMPULSE MODELLED RESPONSE OF A 150MHZ ST-X QUARTZ SAW DELAY LINE DEVICE FOR SENSOR SPECIFIC APPLICATIONS- <b>KOWSALYA S</b>	57
212	PP 103	SYNTHESIS OF CUO SURFACTANT NANO PARTICLES- <b>PARKAVI J</b>	57
213	PP 104	MODEST SOL-GEL CHEMICAL SYNTHESIS OF CU - METAL ORGANIC FRAMEWORKS FOR MULTIPURPOSE APPLICATIONS – <b>MERCILIN DIVYA M</b>	58
214	PP 105	TURNING CARBON DIOXIDE TO ELECTRICITY FOR FUTURE USAGE- <b>MANOJKUMAR T</b>	58
215	PP 106	SYNTHESIS OF ZINC STANNATE (ZNSNO <sub>3</sub> ) PEROVSKITE NANOMATERIALS FOR SOLAR CELL APPLICATIONS- <b>SOLAI DHAYANITHI M</b>	58
216	PP 107	RING LASER GYROSCOPE- <b>AKILA C</b>	58
217	PP 108	PREPARATION AND CHARACTERIZATION OF MOO <sub>3</sub> THIN FILMS BY SPRAY PYROLYSIS TECHNIQUE- <b>KARTHI B</b>	58
218	PP 109	LOW COST, NON-TOXIC, EARTH-ABUNDANT CU <sub>2</sub> ZNSNS <sub>4</sub> AND CU <sub>2</sub> NISNS <sub>4</sub> COUNTER ELECTRODES FOR DYE SENSITIZED SOLAR CELLS APPLICATIONS- <b>HAVINA M</b>	59
219	PP 110	COSMOLOGY AND BLACK HOLES- <b>JAYAPARVATHI L</b>	59
220	PP 111	SIMPLE CHEMICAL SYNTHESIS AND CHARACTERIZATION OF METHYLAMMONIUM LEAD IODIDE-BROMIDE (CH <sub>3</sub> NH <sub>3</sub> PBBR <sub>3</sub> & CH <sub>3</sub> NH <sub>3</sub> PB(IBR) <sub>3</sub> ) NANOMATERIALS FOR PEROVSKITE SOLAR CELL APPLICATIONS- <b>KIRUTHIKA M</b>	59
221	PP 112	LEUCINE DOPED WITH POTASSIUM DI-HYDROGEN PHOSPHATE- <b>MAHESHWARI A</b>	60

S. No.	ABSTRACT ID	TITLE OF THE PAPER	PAGE NO.
222	PP 113	HYDROTHERMAL SYNTHESIS OF P-TYPE $\text{Cu}_2\text{FeS}_4$ NANOPARTICLES FROM METAL-DIETHYLDITHIOCARBAMATE PRECURSORS FOR SOLAR CELL APPLICATIONS- <b>JAISHIKA R</b>	60
223	PP 114	AN OPTIMAL PATTERN AND APPLICATIONS OF NANO TECHNOLOGY IN MEDICAL DIAGNOSIS - <b>C. KALAISELVI</b>	60

**METAL HALIDE PEROVSKITES: A NEW PARADIGM IN NEXT GENERATION NANOMATERIALS FOR PHOTOVOLTAICS**

G. Sahaya Dennish Babu

Department of Physics, Chettinad College of Engineering and Technology, Karur.

Email – dennishbabu@hotmail.com

**Abstract**

In recent years, halide perovskites have been promising as ideal material in the field of optoelectronic devices. Even though perovskite materials were discovered a long time ago, utilizing hybrid organic–inorganic perovskites as a photoactive layer in solar cells started in 2006 and the first report was published in 2009. Hybrid organic–inorganic perovskites are typical crystalline materials with the general chemical formula  $ABX_3$ , where A and B are two cations with very different sizes, and X is an anion that bonds to B. The rapid progress in perovskite-based solar cells has made them the rising star of next generation photovoltaic technologies and these are promising devices with huge attention from the academic community and industrial society. Currently, the power conversion efficiency of perovskite-based solar cells can be as high as 22%. Meanwhile, some important studies (including light-emitting diodes, amplified spontaneous emission, and lasing) based on these perovskites have been sequentially realized. In this presentation, the recent progress in perovskite nanocrystals, including synthetic methods and their applications beyond solar cells will be addressed. Specifically, different synthetic routes to prepare various perovskite nanocrystals are considered, followed by their optoelectronics device fabrication and their applications, including light-emitting diodes, amplified spontaneous emission and lasing, photo-detectors, resistance random access memory devices, and piezoelectric nanogenerators. Finally, an outlook for the future potential applications and possible challenges of perovskite nanocrystals will be addressed.

**Keywords:** Perovskites, Lead-free, Toxicity, Doping, Defect engineering.

**ELECTRON DENSITY, THERMO CHEMICAL AND ENERGETIC PROPERTIES OF HIGH ENERGETIC TNP MOLECULES VIA DFT AND AIM ANALYSIS**

P. Srinivasan\* A. David Stephen

Department of Physics, Chikkaiah Naicker College, Erode

Email: sriniscience@gmail.com

**Abstract**

Thermo chemical and charge density features, such as atomic charges, bond critical points, and electrostatic potential and explosive properties of TNP derivatives described and compared with reported molecules. The bond topological and explosive properties of the highly energetic tri and tetranitrohexahydro pyrimidine derivatives were carefully evaluated by HF and density functional theory (B3LYP) calculations using Bader's AIM analysis [2]. In this derivatives, the ring adopts a chair conformation, in which the C(1)–N(1)–C(2)–C(3) and C(4)–N(2)–C(1)–H(1) bonds are twisted to an angle  $-49.2$  and  $60.7^\circ$ , confirms, both bonds are gauche oriented. Interestingly, the electron density studies, predicts the C–NO<sub>2</sub> bonds have a low charge accumulation at the bond critical point, which indicates that the charges of the bonds are highly depleted compared with all other bonds in the molecule. The charge accumulation in Car–Nar and N=O bonds is found to be high compared with the NO<sub>2</sub> group attached to C–N bonds; their corresponding high negative  $\nabla^2\rho_{\text{bcp}}(r)$  confirms its high solidarity. Furthermore, the thermo chemical and sensitivity calculation based on imbalance parameters predicts that the nitro groups attached to C–N and N–N bonds are more sensitive than the other bonds in the molecule and it confirms the NO<sub>2</sub> group attached to C–N and N–N bonds are very weak bonds in the molecule. These bonds may rupture first and initiate the detonation process when the material is exposed to external stimuli. Importantly, the present study also confirms the fair relation between the charge depletion and the bond sensitivity of the molecule.

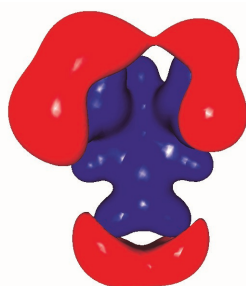


Figure shows the Electrostatic Potential of TNP molecule

**1. References:**

- (a) [1] H S Jadhav, M B Talwar, R Sivabalan, D D Dhavale, S N Asthana and V N Krishnamurthy, Indian journal of Engineering and Materials Sciences, 13 (2006) 80.
- (b) [2] R F W Bader, Atoms in Molecule: A Quantum Theory; Clarendon press: Oxford, UK, 1990
- (c) [3] P Srinivasan, S N Asthana, R B Pawar, P Kumaradhas, Struct Chem, 22 (2011), 1213
- (d) [4] P Srinivasan, K Maheshwari, M Jothi, P Kumaradhas, Central European Journal of Energetic Materials, 9(1) (2012), 59

**ANTIMICROBIAL ACTIVITY OF PbS THINFILM BY CHEMICAL BATH DEPOSITION METHOD**

C. Aruljothi, Department of Physics, P.K.R Arts College for Women, Gobichettipalayam  
E.mail ID: aruljothick@gmail.com

#### Abstract

Lead Sulfide thin film was deposited on glass substrate prepared from lead acetate and thiourea solution using Chemical Bath Deposition method. XRD studies show that, films prepared are in nanocrystalline range. Also the diffraction peaks are found to be in good agreement with standard JCPDS data. The average grain size determined from XRD pattern is 33.59 nm. SEM image of PbS film consists of individual isolated particles and the grains are very small with equal shape and size. The effect of PbS thinfilm was investigated against *Bacillus Cereus*, *S.Aureas*, *Klebsiella* and *Vibrio calarae* using well-diffusion technique and the Antimicrobial Activity is determined based on the inhibition zone.

### MODELLING OF A 250MHZ ST-X QUARTZ SAW DELAY LINE DEVICE FOR POTENTIAL SENSOR APPLICATIONS

Banu Priya R, Venkatesan T, Hareesh M Pandya\*  
Department of Physics, Gobi Arts and Science College, Gobi  
Department of Physics, Chikkanna Government Arts College, Tirupur  
Email: hareesh.pandya@rediffmail.com

#### Abstract

SAW based gas sensing devices have extensive physical and chemical parameters, including surface mass, stress, strain, liquid density, viscosity, permittivity and conductivity. These SAW devices were developed for identification of Chemical Warfare Agents (CWA) like nerve agents, tear agents and etc., The advantages of SAW sensors are their miniaturized size, low cost, highly sensitive and accessibility in remote wireless system. This paper presents the frequency response of a 250 MHz ST-X Quartz SAW delay line device fabricated with uniform IDTs. SAW device design parameters like piezoelectric substrate, structure of IDT, number of finger pairs, device frequency and etc., are optimized and its frequency response studied based on the first order Impulse Response Model, Equivalent Circuit Model and Coupling of Modes Model via a unique custom made MATLAB algorithm. The results obtained are analyzed to ultimately help in the effective design, development and modelling of such devices for potential applications in specific sensors. Analysis and modelling will provide insight into the influence of the device design parameters on the sensor performance and help in practical design and optimization of SAW based chemical sensor systems. Modelled results are also compared with experimental results and the validation study performed presents good agreement between model and experiment.

**Keywords:** Surface Acoustic Wave, Interdigital Transducer, Impulse Response Model, Equivalent Circuit Model, Coupling of Modes Model

### REINFORCEMENT EFFICIENCY OF MWCNTS ON POLYESTER/CARBON FIBRE NANO COMPOSITE

S. Karthikeyan, M. Sujatha, N. Hemalatha, S. Gayathri  
Department of Chemistry, Chikkanna Government Arts College  
Department of Chemistry, Palanisamy College of Arts, Perundurai  
Email: environkarthi@gmail.com

#### Abstract

Multi-Walled Carbon nanotubes (MWCNTs) have outstanding electrical, thermal and mechanical properties, which make them interesting material for application in nanotechnology. In this present study, we have been synthesised carbon Multi-walled nanotubes using Tire pyrolytic oil especially derived from end of life tires (ELT) by spray pyrolysis on quartz substrate with ferrocene as a catalyst under argon atmosphere. The main advantages of this process are facile and robust technique with low cost and easily available precursor, which is suitable for mass and large scale production of one dimensional carbon nanomaterial. A newly developed strategy offering promising results is to reinforced Polyester matrices with nano sized particles such as MWNTs and make new materials with enhanced properties. The unique properties of this low dimensional carbon nano materials such as Nanometric size, high specific surface area and the possibility of combining them with conventional reinforcements have caused intense research in the field of nano composites. Finally as grown Multi-walled carbon nanotubes filled carbon fiber reinforced Polyester composite were prepared by hand laying process and their mechanical and thermal absorption characters were analysed and reported under ASTM standards. Mechanical properties such as tensile strength, tensile modulus, flexural strength and flexural modulus of unfilled PE/CF and MWNTs filled carbon fiber reinforced Polyester hybrid nano composite were found that the addition of MWNT in PE/CF laminates enhanced all the tested mechanical properties when compared with unfilled laminates. It can also observed from 0.05 to 0.2 wt % MWNT addition, the properties such as tensile strength, tensile modulus, flexural strength, flexural modulus were found to increase and further addition of MWNT (>0.2wt%) decreases the above said properties. Even though the efficiency obtained are not comparable with efficiency of commercial advances hybrid nano composite materials, this study shows the potential of environmental friendly carbon nano material to be used as a filler in the hybrid Polyester composite and may be an initiative for more focused research in this direction.

**Keywords:** MWCNT, reinforced Polyester matrices, one dimensional carbon nanomaterial.

### ULTRASONIC BEHAVIOUR OF FEW ORGANIC TERNARY MIXTURES AT VARIOUS TEMPERATURES

R. Ezhil Pavai and L. Balua  
Department of Physics, Thirukolanjiappar Government Arts College, Vriddachalam  
Department of Physics, Government Arts College, C.Mutlur  
Email – ezhilpavaibalu@yahoo.com

**Abstract**

Ultrasonic velocity, density and viscosity have been measured in the ternary mixtures of 1-alcohols with common binary of acetonitrile and dimethyl sulphoxide at temperatures 303, 308 and 313 K. From the experimental data, adiabatic compressibility, intermolecular free length, free volume, internal pressure, acoustic impedance, relaxation time, Gibb's free energy and the excess values of some of the parameters are evaluated. The change in the parameters with composition suggests that the interaction between the mixtures is strong.

**MECHANICAL CHARACTERIZATION OF AI - 2024 REINFORCED WITH LIME STONE AND GRAPHITE BY STIR CASTING METHOD**

M. Muniyappan, N. Iyandurai\*, P. Duraisamy

Department of Physics, Thiruvalluvar Govt. Arts College, Rasipuram, Namakkal, India.

\*Email: ayandurai@rediffmail.com

**Abstract**

Conventional monolithic materials have limitations in achieving good combination of strength, stiffness, toughness and density. To overcome these shortcomings and to meet the ever increasing demand of modern day technology, composites are most promising materials of recent interest. Metal matrix composites (MMCs) possess significantly improved properties including high specific strength; specific modulus, damping capacity and good wear resistance compared to unreinforced alloys. In view of this, the present study focuses on the formation of aluminium-lime stone-graphite hybrid metal matrix composites. The present study was aimed at evaluating some properties of Aluminium 2024 in the presence of lime stone, graphite and its combinations. Consequently aluminium metal matrix composite combines the strength of the reinforcement with the toughness of the matrix to achieve a combination of desirable properties not available in any single conventional material. The compositions were added up to the ultimate level and stir casting method was used for the fabrication of aluminium metal matrix composites. Structural characterization was carried out on metal matrix composites by x-ray diffraction studies and optical microscopy was used for the micro structural studies. The mechanical behaviors of metal matrix composites like density, tensile strength, yield strength, elongation and hardness tests were ascertained by performing carefully designed laboratory experiments that replicate as nearly as possible the service conditions. In the presence of lime stone and graphite [lime stone (5%) + graphite (10%) and graphite (10%) + lime stone (10%)] with aluminium, it was fairly observed that the density of the composites was decreased and the hardness was increased. Correspondingly, the increase in tensile strength was also observed but elongation of the hybrid metal matrix composites in comparison with unreinforced aluminium was decreased. The aluminium- lime stone - graphite hybrid metal matrix composites significantly differed in all of the properties measured. Aluminium in the presence of lime stone (10%)- graphite (10%) was the hardest instead of aluminium- lime stone and aluminium- graphite composites.

**Key Words:** Aluminium 2024, Lime Stone, Graphite, Mechanical characterization.

**PARAMAGNETIC NATURE OF CD DOPED MNO NANOPARTICLES**

G.Kaaviya, P. Monisha, S. S. Gomathi, K. Pushpanathan

Department of Physics, Sri Sarada College for Women, Salem – 636 016, India

Nanomaterials Research Laboratory, Department of Physics, Government Arts College, Karur, India

Email: gomathi1973@gmail.com

**Abstract**

Pure and cadmium doped manganese oxide nanoparticles were synthesized by chemical precipitation method. The magnetic behavior of manganese oxide nanoparticles have wide range of applications in lithium ion batteries. Variety of techniques like XRD, FTIR, UV-VISIBLE, PL, SEM, EDAX and VSM were used to carry out the characterization of the nanoparticles. The structural investigations were done by x-ray diffraction analysis which confirmed the formation of face centred cubic structure. FTIR spectra identifies the functional group present in molecular structure. The band gap energy was calculated from ultraviolet visible spectroscopy which ranges from 3.12 eV to 3.20 eV. Photoluminescence study was carried out to know the occurrence of emission peaks. Morphological study was done by scanning electron microscopy which showed the presence of spherically agglomerated particles. The presence of dopant in the doped samples were found using energy dispersive x-ray measurements. Magnetic properties were studied by vibrating sample magnetometer which exhibits the phase change from ferromagnetic to paramagnetic particles.

**Keywords:** Nanocrystalline; Agglomeration; Spherical; Paramagnetism

**SYNTHESIS, CHARACTERIZATION AND ANTIMICROBIAL ACTIVITIES OF COPPER OXIDE NANOPARTICLES FROM THE LEAF EXTRACT OF CYNODON DACTYLON**

S. Velmurugan, S.Ravi, S.Saravanan

Department of physics, Govt.Arts college, C.Mutlur, Chidambaram

Department of Engineering Physics Section, FEAT, Annamalai University, Annamalai nagar.

Department of Physics, D.G. Govt. Arts college for women, Mailadadurai.

Email:drvelmuruganphy@gmail.com

**Abstract**

Biologically synthesized nanomaterial has become an important branch of nanotechnology. The present study described the synthesis of copper oxide nanoparticles (CuO Nps) using the leaf aqueous extracts from cynodon dactylon and its antimicrobial activities. The nanoparticles were obtained characterized by UV –Visible spectroscopy, X ray diffraction (XRD), Fourier transmission infrared (FT-IR) spectroscopy, Scanning electron microscop Fairlands, py (SEM) and Energy dispersive spectroscopy (EDS) analysis. In this study,investigated antimicrobial activity of the green synthesized CuO Nps. The results depicted different concentration of CuO Nps was increased and also increased antimicrobial activities. However, the green synthesized CuO NPs was more potent than Bare CuO and the leaf of cynodon dacylon. Finally concluded the CuO NPs exhibited interesting antimicrobial with both gram positive and gram negative bacterial and yeast at micro molar concentration.

**Keywords:** Green synthesis , CuO NPs, cynodon dactylon, FT-IR, SEM with EDS , Antimicrobial activities.

### **SYNTHESIS AND CHARACTERIZATION OF NON-LINEAR OPTICAL CRYSTAL L-VALINE HYDROCHLORIDE**

Priyadharsini T.N, Department of Physics, P.K.R. arts college for women, Gobichettipalayam  
Email: tnprima27@gmail.com

#### **Abstract**

A nonlinear semiorganic material L-Valine Hydrochloride (LVHCL) was synthesized. Optical quality single crystal of LVHCL was grown by slow evaporation solution growth technique. Optical transmission studies show that the grown crystals were optically transparent and the  $\lambda$  cutoff occurs at 260 nm. The grown Crystal is transparent for Second Harmonic beam of Nd-YAG laser and other applications in the blue region. L-Valine Hydrochloride (LVHCL) is thermally stable up to 270°C, which is comparatively higher than L-Valine Hydrobromide. L-Valine Hydrochloride (LVHCL) is optically transparent in the entire visible region with 85% transparency level. The presence of various functional groups present in the crystal has been confirmed by FTIR spectral analysis. The structure of the grown crystals was confirmed by powder XRD analysis and Crystalline size are calculated. Mechanical hardness studies reveal that Vicker's hardness number increases as the load increases and then decreases for higher loads.

**Keywords:** Slow evaporation method, Single Crystal XRD.

### **EFFECT OF CADMIUM IONS ON THE STRUCTURE AND ELASTIC PROPERTIES OF B2O3 – BaO – MnO2 GLASSES**

L. Balua and R. Ezhil Pavai  
Department of Physics, Government Arts College, C.Mutlur  
Department of Physics, Thirukolanjiappar Government Arts College, Vriddachalam Tamil Nadu, India  
Email: ezhilpavaibalu@yahoo.com

#### **Abstract**

Borate based glass systems of binary B2O3- BaO and ternary B2O3 – BaO – MnO2 with different compositions are prepared by melt quench technique. The ultrasonic (both longitudinal and shear) velocities are measured at 303 K and 10 MHz frequency using the Pulse Echo Overlap method. Density of the glass samples is measured by Archimedes principle using water as immersion liquid. From the measured data, the elastic moduli and other parameters such as molar volume, Poisson's ratio, acoustic impedance, microhardness and Debye temperature have been evaluated. The results of the parameters are used to gain knowledge about the structural and mechanical properties and are correlated to the compactness of the glasses.

### **STRUCTURAL AND OPTICAL CHARACTERIZATION OF ZEOLITE POWDER SYNTHESIZED BY SOL-GEL TECHNIQUE**

M.Renugadevi\* and P.Peula kumar  
Department of physics with computer Applications, L.R.G Govt Arts College for women, Tirupur  
Email: rdmpphysics@gmail.com – 9360312570

#### **Abstract**

In the present work an attempt has been made to synthesize zeolite material by sol-gel technique. The structural and optical properties has been studied by XRD, EDAX, SEM, FTIR and UV spectroscopy analysis. The zeolite material prepared by sol-gel method is found to be crystalline in nature. The diffraction pattern of the sample matched well with Linde (A-LTA) structure with the appropriate space group. The weight and atomic percentage of Na, Al and Si in the prepared sample were found. From SEM analysis it is inferred that the crystals on the top of dense layer showed complete morphology with average size. FTIR spectra shows three main absorption band and the peak observed in the range of 2360 is due to variation of temperature and the presents of impurities. Adsorption bands can be assigned to symmetrical and asymmetrical stretching vibrations of internal structure respectively. No additional peaks are observed in the UV – Vis absorption spectroscopy except the expected peak.

**Keywords:** sol-gel technique, zeolite powder.

### **SYNTHESIS AND LUMINESCENCE PROPERTIES OF K+ COMPENSATED CAMO04:DY3+ NANOPHOSFOR PREPARED VIA POLYOL METHOD**

Mohanprakash V, Ranjani K, A. Suresh Kumar\*, Kallol Mohanta, Rajendra Kumar R.T, Sivaraj P,  
Department of physics, NGM college, Pollachi, Coimbatore  
Department of physics, PSG College of Technology, Coimbatore  
Department of Nanoscience and Technology, Bharathiar University, Coimbatore  
\*Email: asureshngm@gmail.com

**Abstract**

Phosphor converted LED technique is an important approach to produce white light for solid-state technique. The commercial white LED involves a blue-emitting InGaN LED coated with (YAG:Ce<sup>3+</sup>) which has low color rendering index (CRI). But on the other hand NUV/UV LED chip with multicolor phosphor has excellent CRI but low efficiency due to different degradation of each phosphor. So we used single phase host lattice doped with rare earth ion. So in order to overcome the above problem, we have used single phase host lattice doped with rare earth for the generation of white light from NUV/UV LED chip. Calcium Molybdates (CaMoO<sub>4</sub>) are considered as good inorganic host for luminescent material due to broad absorption band of Mo-O bond in the NUV region. It transfers the absorbed energy to the dopant ion being an excellent host for phosphor materials. CaMoO<sub>4</sub> emits bluish green emission in the range of 360–650 nm with a maximum peak at 498 nm. Since the emission is broad it is difficult to tune the color. So we have doped Dy<sup>3+</sup> ions in the CaMoO<sub>4</sub> lattice which emits blue and yellow color. Dy<sup>3+</sup> has poor luminous emission and absorption cross section (0.01–1 cm<sup>2</sup>). The luminous emission of Dy<sup>3+</sup> can be increased when ion occupies the crystallographic site of Ca<sup>2+</sup> ion. By adjusting the yellow to blue intensity ratio, it is possible to obtain white light from Dy<sup>3+</sup> activated CaMoO<sub>4</sub>. Polyol method is used to synthesize the CaMoO<sub>4</sub>:Dy<sup>3+</sup> phosphor due to uniform size distribution, low degree of agglomeration, simple equipment, short time period and handy operation.

A series of Ca<sub>1-x</sub>MoO<sub>4</sub>:Dy<sup>3+</sup>x (x = 1, 1.5, 2, 3, 4 and 5 mol %) and Ca<sub>0.98-x</sub>MoO<sub>4</sub>:Dy<sup>3+</sup><sub>0.02</sub>K<sub>x</sub> (x = 1, 1.5, 2, 3, and 4 mol %) are prepared by polyol method at 130 °C for 3 hrs. The effect of doping of alkali metal ion (K<sup>+</sup>) in CaMoO<sub>4</sub>:Dy<sup>3+</sup> phosphor, phase structure and luminescent properties of the phosphor were analysed using x-ray powder diffraction, FTIR, and fluorescence spectrophotometry. The result confirmed that all obtained powder are single phase Schellite structure with the tetragonal symmetry and the crystallite size in the range of 25 – 35 nm. The dislocation density and microstrain of CaMoO<sub>4</sub> is calculated as 8.5897 × 10<sup>14</sup> (m<sup>-2</sup>) and 1.114 × 10<sup>-3</sup>. The diffuse reflectance spectra of the CaMoO<sub>4</sub>:Dy<sup>3+</sup> show the main peak at 210 nm and the band gap is calculated as 5.1 eV. From the FTIR study, the bands at 820/cm and 441/cm are assigned to asymmetric stretching and bending vibration of MoO<sub>4</sub><sup>2-</sup> tetrahedral respectively. The emission spectra shows the strongest peak at 351 nm (6H<sub>15/2</sub> → 6P<sub>7/2</sub>). The emission spectra of CaMoO<sub>4</sub>:Dy<sup>3+</sup> and K<sup>+</sup> co-doped CaMoO<sub>4</sub>:Dy<sup>3+</sup> show bright yellow emission at 576 nm (4F<sub>9/2</sub> → 6H<sub>15/2</sub>) and blue emission at 487 nm (4F<sub>9/2</sub> → 6H<sub>13/2</sub>). The optimum concentration of Dy<sup>3+</sup> is 2 mol %. The calculated Commission Internationale de l'Eclairage (CIE) chromaticity coordinates for the optimised phosphor Ca<sub>0.98</sub>MoO<sub>4</sub>:Dy<sup>3+</sup><sub>0.02</sub> under 351 nm excitation is (x = 0.3866 and y = 0.3884) which is close to the National Television Standard Committee (NTSC) (x = 0.310 and y = 0.316) coordinates. The CRI and correlated color temperature (CCT) of Ca<sub>0.98</sub>MoO<sub>4</sub>:Dy<sup>3+</sup><sub>0.02</sub> is found to be 40 % and 3921 K. The color co-ordinate gradually shifts from yellow region to the white with the increasing content of K<sup>+</sup> content. The study reveals that K<sup>+</sup> co-doped CaMoO<sub>4</sub>:Dy<sup>3+</sup> phosphor could be potential candidate for near ultraviolet (NUV) excited white-LED applications.

**PARAMAGNETIC NATURE OF CD DOPED MNO NANOPARTICLES**

G. Kaaviya, P. Monisha, S. S. Gomathi, K. Pushpanathan

Department of Physics, Sri Sarada College for Women, Salem, India

Nanomaterials Research Laboratory, Department of Physics, Government Arts College, Karur, India

\*Email: gomathi1973@gmail.com

**Abstract**

Pure and cadmium doped manganese oxide nanoparticles were synthesized by chemical precipitation method. The magnetic behavior of manganese oxide nanoparticles have wide range of applications in lithium ion batteries. Variety of techniques like XRD, FTIR, UV-VISIBLE, PL, SEM, EDAX and VSM were used to carry out the characterization of the nanoparticles. The structural investigations were done by x-ray diffraction analysis which confirmed the formation of face centred cubic structure. FTIR spectra identifies the functional group present in molecular structure. The band gap energy was calculated from ultraviolet visible spectroscopy which ranges from 3.12 eV to 3.20 eV. Photoluminescence study was carried out to know the occurrence of emission peaks. Morphological study was done by scanning electron microscopy which showed the presence of spherically agglomerated particles. The presence of dopant in the doped samples were found using energy dispersive x-ray measurements. Magnetic properties were studied by vibrating sample magnetometer which exhibits the phase change from ferromagnetic to paramagnetic particles.

**Keywords:** Nanocrystalline; Agglomeration; Spherical; Paramagnetism

**ANTIBACTERIAL APPLICATION OF UNDOPED AND Al DOPED CdO NANOCRYSTALLINE THIN FILMS**

Radhika.V, Annamalai. V\*

Dept of Physics, PKR Arts College for Women, Gobichettipalayam, Tamilnadu.

Dept of Physics, Chikkanna Govt. Arts College, Tiruppur, Tamilnadu.

\*Email: annamalai\_140795@yahoo.co.in

**Abstract**

Nano crystalline thin films of undoped and Al doped Cadmium oxide were synthesized using chemical bath deposition method and were annealed at 500 °C. The films were characterized to study their structural, optical and compositional properties. Antibacterial activity of CdO films were assayed by using the agar well diffusion technique. The antibacterial treatment of undoped and doped CdO solutions was analyzed to the Gram-positive bacteria *Bacillus cereus* and the gram-negative bacteria *Vibrio Cholera*. The present study reveals that the diameter of zone of inhibition is found to be more for gram-negative bacteria than gram-positive, both for undoped CdO and doped CdO.

**Keywords:** antibacterial activity, CdO, Al doped Cadmium oxide

**FACILE SYNTHESIS AND CHARACTERIZATION OF PURE AND Ce, Pb DOPED SnS NANOPARTICLES**

K.Janani, St.Joseph College for Women, Tamil Nadu Tirupur.

**Abstract**

Binary semiconductors are very promising material because of the attractive physical properties. The quest for the enhancing the properties of the material leads to evaluate Tin Sulphide(SnS) which is a direct band gap semiconducting material known for its unique properties. SnS were synthesized using solvo thermal irradiation method with a molar ratio of 1:3 which is maintained throughout this synthesis procedure. SnS nanomaterial were successfully prepared by using tin chloride and thiourea were mixed separately with ethylene glycol as a solvent which is subjected to microwave irradiation at a temperature ranging from 1000-1500°C. The characterisation techniques like XRD, TEM and UV-Visible were used to analyse the structural and optical properties of SnS nanomaterial.

**Keywords:** SnS, microwave irradiation, tin chloride, thiourea, ethylene glycol, XRD, TEM and UV-Visible spectroscopy.

**NANOCELLULOSE FROM BIOMATERIALS AND ANALYTICAL TECHNIQUES –A REVIEW**

T.YASODHA\* &amp; K.HARIMANDHIRAN

Dept of Biotechnology PGP College of Arts &amp; Science, Namakkal, India

\*Email:techwin88@gmail.com

**Abstract**

The world population is currently growing by approximately 83 million people each year. According to the current projections the population is expected to reach 10.5 billion in 2050. Human population is going to face threat to life due to lack of economical and eco-friendly processes to meet their needs. One perfect solution for this is the nanotechnology to save earth and sustain life. Nanocellulose research, which arises from the green nature of the particles, their fascinating physical and chemical properties, and the diversity of applications that can be impacted by this material. These tiny nanocellulose fibers have huge potential in many applications, from flexible optoelectronics to scaffolds for tissue regeneration. This paper is reviewing the main areas of nanocellulose research: ■ Nanocellulose from biomaterials-Plant and microbial resources. ■ Analytical techniques – o HPLC-High performance liquid chromatography o FTIR-Fourier-transform infrared spectroscopy o SEM- Scanning electron microscopy o ESEM-Environmental Scanning Electron Microscopy o XRD-X-RAY DIFFRACTION o TGA –Thermogravimetric Analysis \*Applications-photonics, films and foams, nanocomposites, and medical devices.

**SENSITIVITY ENHANCEMENT OF SURFACE PLASMON RESONANCE BIOSENSOR WITH COPPER (Cu) & TRANSITION METAL DICHALCOGENIDES (TMDCs)**

P.Maheswari, A.Nisha, K.B.Rajesh\*, V.Ravi

Department of physics, PSGR Krishnammal College for Women, Coimbatore.

Department of physics, Periyar University, Salem, Tamil Nadu, India

\*Department of Physics, Chikkanna Government Arts College, Tirupur, Tamil Nadu, India.

Department of physics, Government Arts College, Salem.

\*Email :rajeskb@gmail.com

**Abstract**

In this work a new configuration of Surface Plasmon Resonance biosensor, with various 2D materials called Transition Metal Dichalcogenides (Black Phosphorous, Graphene,  $\text{MoS}_2$ ,  $\text{WS}_2$  and  $\text{MoSe}_2$ ) is over coated on the base of copper is analysed theoretically based on N-layered matrix method for kretschmann configuration. Here the TMDCs are introduced for the enhancement of sensitivity and better absorbance of biomolecules. The proposed configurations of various TMDCs increases the sensitivity with increasing the number of layers, the higher sensitivity are obtained for all TMDCs notably  $315^\circ/\text{RIU}$  and shows sensitivity for all refractive index of the sensing mediums from 1.30 to 1.40. These higher sensitivity materials are better for further device applications.

**Keywords:** Surface Plasmon Resonance, Biosensor, Copper, Sensitivity, Transition Metal Dichalcogenides.

**FOCUSING PROPERTIES OF HYBRIDLY POLARIZED SINH GAUSSIAN BEAM THROUGH A DIELECTRIC INTERFACE**

M.Lavanya, C.Kavitha, M. Udhayakumar, K.B.Rajesh\*

Department of Physics, PSGR Krishnammal College for Women, Coimbatore, Tamilnadu, India.

Department of Physics, Chikkanna Government Arts College, Tirupur, Tamilnadu, India

\*Email:rajeskb@gmail.com

**Abstract**

The tight focusing properties of hybridly polarized Sinh Gaussian beam through a dielectric interface are investigated numerically by vector diffraction theory. The FWHM and depth of focus are calculated for the different parameters of Sinh Gaussian beam. It is observed that by increasing the value of  $n$  to 0.9 for order  $m=2$  and  $0 = 0.125$  the focal depth improved to 94.8. Increasing the order  $m$  to 8, the focal depth is found to be 33.7. Increasing the value of  $n$  to 0.6 for  $0 = 0.500$  and  $m=2$  the depth of focus and FWHM is found to be 22.7 and 0.6. Further increasing the order  $m$  to 8 for the higher values of  $n$  the depth of focus is observed as 34.4 and spot size is preserved as 0.5. To get better confinement with longer focal depth and smallest focal size sinh beam is selected with the beam waist of  $0 = 0.500$ ,  $m=8$  and  $n=0.9$ . By properly choosing the parameters one can generate a highly confinement of transverse optical needle with long focal depth and minimum spot size in the presence of dielectric interface.

**Keywords:** Focusing properties, Sinh beam, dielectric interface, vector diffraction theory

## GREEN SYNTHESIS OF COPPER NANOPARTICLES FROM BIOPHYTUM SENSITIVUM LEAF EXTRACTS AND THEIR ANTIBACTERIAL POTENTIAL APPLICATIONS

N.Sundaramurthy and S.Rajalakshmi

Department of Physics, Thiru Kolanjiappar Government Arts College, Vriddhachalam  
University College of Engineering Panruti, Anna University,  
Email:nagasundaramphysics@gmail.com

### Abstract

This work is to report an environmental gentle route for the fabrication of copper oxide nanoparticles using Biophytum sensitivum (L.) leaves extracts at room temperature. This method is completely a green method, free from toxic and harmful solvent. The leaf extract acts as both reducing and capping agent. The synthesized copper nanoparticles were confirmed by the change of colour after addition of leaf extract into the solution. Copper oxide particles such prepared are in Nano scale and there morphology and size are characterized using SEM, UV –Visible spectroscopy, IR spectroscopy and EDX. Copper oxide NPs synthesized by this method can be used for the photo catalytic degradation of methyl orange. This photo catalytic effect of copper oxide nanoparticles can be contributed to its small size. Nanoparticles have many active sites as compared to the bulk materials because of its large surface to volume ratio. Copper-NPs exhibit good antibacterial activities.

**Keywords:** copper nanoparticles, Green method, Biophytum sensitivum (L.), Methyl orange, Anti bacterial.

## A SCIENTIFIC UPDATE ON NANOTECHNOLOGY

K.K.VISWANATHAN, DEPT. OF BCA, CGAC, TIRUPUR.\*Email:kkviswas1978@gmail.com

### Abstract

The use of nanotechnology in medicine has the potential to have a major impact on human health for the prevention, diagnosis, and treatment of diseases. One particular aspect of the nanomedicine field which has received a great deal of attention is the design and development of nanoparticulate nanomedicines (NNMs) for drug delivery (i.e., drug-containing nanoparticles). NNMs are intended to deliver drugs via various mechanisms: solubilization, passive targeting, active targeting, and triggered release. The NNM approach aims to increase therapeutic efficacy, decrease the therapeutically effective dose, and/or reduce the risk of systemic side effects. In order to move a NNM from the bench to the bedside, several experimental challenges need to be addressed. This review will discuss the current trends and challenges in the clinical translation of NNMs as well as the potential pathways for translational development and commercialization. Key issues related to the clinical development of NNMs will be covered, including biological challenges, as biomarkers, ability to locate and treat tumours, delivering the genetic material etc., comparison to current therapies.

## AUTOMATIC FABRIC DEFECT DETECTION SYSTEM USING DIGITAL IMAGE PROCESSING AND ARTIFICIAL NEURAL NETWORK

S.Sahaya Tamil Selvi, G.M. Nasira

Department of Computer Applications, Chikkanna Govt. Arts College Tirupur , India  
Email: nasiragm99@yahoo.com

### Abstract

The textile industry in India, next to agriculture is the one to serve as huge employment generating sector for both skilled and unskilled labours. Producing good quality fabric has become a basic necessity and prime issue of every Textile industry. For a long time fabric defect detection is carried out manually with human visual inspection in most of the small/medium scale industries. Automatic fabric inspection is important to maintain the quality of fabric. The fabric inspection is performed based on the analysis performed on digital images of the fabric. The recognizer acquires digital fabric images by image acquisition device and sends it to a computer system to processes the received image. The computer system makes a fabric analysis to find out whether the fabric is defect free or defect. In spite of number of algorithms available, the research is still a challenging one. This paper presents the processes of automatic fabric defect detection system using Digital image processing techniques and Artificial Neural Network (ANN). The performance of the system is evaluated based on performance metrics.

**Keywords—** Fabric defect; Fabric analysis; Fabric inspection; Performance metrics; Artificial Neural Network (ANN); Digital image processing..

## CURRENT TRENDS OF NANOTECHNOLOGY FOR CANCER THERAPY

D.SUDHA, DEPT. OF BCA, CGAC, TIRUPUR. Email: sudha0719@gmail.com

### Abstract

Nanoparticulate technology is of particular use in developing a new generation of more effective cancer therapies capable of overcoming many biological, biophysical and biomedical barriers that the body stages against a standard intervention. Targeted delivery of drug molecules to tumor tissue is one of the most interesting and challenging endeavors faced in pharmaceutical field, due to the critical and pharmacokinetically specific environment that exists in tumor. Over these years, cancer targeting treatment has been greatly improved by new tools and approaches based on nanotechnology. Nanoparticles show much promise in cancer therapy by selectively gaining access to tumor due to their small size and modifiability. In this review, nonmaterial and biomarkers of cancer, general principle of drug targeting to cancer, intracellular mechanisms, nanoparticles based formulation in market, several recent applications in medicine as diagnostic and therapeutic are discussed. The review's basic approach is: the defining features of cancer nanotechnology are embedded in their breakthrough potential for design and development of nanoparticle based drugs.

## INTEGRATING NANOTECHNOLOGY INTO AGRI-FOOD SYSTEMS RESEARCH IN INDIA AGRICULTURAL NANOTECHNOLOGIES

T.UMARANI, DEPT. OF BCA, CGAC, TIRUPUR. Email:umagaccs@gmail.com

### Abstract

Nanotechnology is recognised by the European Commission as one of its six "Key Enabling Technologies" that contribute to sustainable competitiveness and growth in several industrial sectors. The current challenges of sustainability, food security and climate change are engaging researchers in exploring the field of nanotechnology as new source of key improvements for the agricultural sector. However, concrete contributions are still uncertain. Despite the numerous potential advantages of nanotechnology and the growing trends in publications and patents, agricultural applications have not yet made it to the market. Several factors could explain the scarcity of commercial applications. On the one hand, industry experts stress that agricultural nanotechnology does not demonstrate a sufficient economic return to counter balance the high initial production investments. On the other hand, new nanotech regulation in the EU might create regulatory uncertainty for products already on the market and affect public perception. However, recent studies demonstrate that public opinion is not negative towards nanotechnology and that the introduction on the market of nanotech products with clear benefits will likely drive consumer acceptance of more sensitive applications. The rapid progress of nanotechnology in other key industries may over time be transferred to agricultural applications as well, and facilitate their development. That are being rapidly exploited in medicine, biotechnology, electronics, material science and energy sectors, among others. These promising developments also concern the agri-cultural sector, in which continuous innovation is strongly needed because of increasing global food security and climate change challenges. In the past, agriculture benefited from many different technological innovations, including hybrid varieties, synthetic chemicals and biotechnology, and researchers are now seeking in nanotechnology a new source of agricultural improvements. However, while the food industry can be seen to be clearly benefiting from nano technology (in particular for food processing, distribution, packaging and functional food), its real contribution to the agricultural sector is still uncertain.

## OIL SPILL DETECTION IN NANOTECHNOLOGY USING IMAGE SEGMENTATION

Kavitha.C, Department of Computer Science, St.Joseph's College For Women,Tirupur.4  
Email:kavithachelladurai.16183@gmail.com

### Abstract

Nanotechnology is one of the Intensive application that is used in image processing. It is the manipulation of matter with at least one dimension sized from 1 to 100 nanometers. In Oceans, Oil pollution is one of the most harmful pollution, and these oil pollutions mainly comes from ships which leaks oil, explosions of oil platforms or submarine pipelines etc. The direct economic losses of each time accidents caused could be millions or tens of millions of upper and lower, so the action of monitoring oil leakage with regard to the ocean becomes significantly important. Analyzing the large number of Synthetic Aperture Radar (SAR) images at the nanoscale level is a challenging task. One of the crucial steps in image processing is nanostructure image segmentation. There are various ways to attain segmentation. The best way to attain segmentation is Similarity Based Approach. In this proposal, the comparison of all Similarity Based techniques are thoroughly studied for the simulated data as well as the real nanostructure images of oil spills in oceans. This motivates to design a system that will not only recognize similarities and differences among images, but also do efficiently and accurately.

**Keywords:**Nanotechnology, Image segmentation

## NATIONAL SEMINAR IN CURRENT TRENDS IN NANO TECHNOLOGY

S.ANNAPOORANI, DEPT. OF BCA, CGAC, TIRUPUR. Email :poorani3379@gmail.com

### Abstract

Nanotechnology is viewed as merely a way to make stronger and lighter tennis rackets, baseball bats, hockey sticks, racing bikes, and other athletic equipment. But nanotechnology promises to do so much more. A more realistic view is that it will leave virtually no aspect of life untouched and is expected to be in widespread use by 2020. Mass applications are likely to have great impact particularly in industry, medicine, new computing systems, and sustainability. Here are some underlying trends to look for, many interconnected, and all expected to continue to accelerate.

## CHOLINE ESTERASE BASED BIOSENSOR FOR THE DETECTION OF CADMIUM TOXICITY IN FRESHWATER FISH HETEROPNEUSTES FOSSILIS (BLOCH.) BRAIN

M.V. RADHAKRISHNAN, Department of Zoology, Chikkanna Government Arts College, Tirupur  
Email: mvrkrishnan44@yahoo.com

### Abstract

In the present investigation an attempt has been made to understand the Cholinesterase-based biosensor using the freshwater catfish *Heteropneustes fossilis* brain for the detection of the heavy metal cadmium. Acetylcholinesterase (AChE) is a fast acting enzyme that is involved in hydrolysis of the neurotransmitter acetylcholine (ACh) that is located at the synaptic cleft. AChE is the target for inhibitors such as heavy metals due to its critical function in the nervous system and due to its sensitivity, AChE has been manipulated to be used in biomonitoring and bioassay for those contaminants in various species of fish. The investigation of cholinesterase or AChE activity in fish tissues as early-warning biomarker was made recently for the assessment of pollution in

ponds or lakes as a result of extensive industrialisation and urbanisation which affect the non target organisms thereby affecting the human body through the inhibition of cholinesterase enzyme (ChE), which plays the role in human detoxifying process. ChE-based biomarker was considered as an effective method for the monitoring of environmental contamination. This study highlights the capability of a ChE based biosensor for detecting contamination caused by the heavy metal cadmium, which can later become one beneficial method for bioremediation. Cadmium with the concentration of 10 mg/L were incubated with *H. fossilis* ChE from brain sample with joined optimal assay parameters. The in vitro studies of ChE inhibition was recorded that the brain ChE was inhibited by Cd and lowered the activity. The binding of cadmium either at the active or allosteric site of ChE were determined by amino acid residue. Interaction of cadmium with the negatively charged amino acids such as aspartate or imidazole group of histidine, or cleavage of disulfide bond are capable of inhibiting ChE because of changes in its structure. From this study, it is clear that the sensitivity of ChE inhibition by cadmium was determined in the brain of *H. fossilis* and these changes can be considered a for the detection of heavy metals pollution in the aquatic environment.

**Keywords :** Choline Esterase, biosensor, Cadmium toxicity, *Heteropneustes fossilis*

## CURRENT INNOVATIONS AND FUTURE PERSPECTIVES IN NST

R.Umashankar

### Abstract

Nanotechnology is the most innovative, cutting-edge areas of scientific study. Below are some of the most innovative nanotechnology advancements to date.

1. **Health: Drug Delivery** Cancer treatment methods risk damage to normal tissue or incomplete eradication of the cancer. Chemotherapy often kills healthy cells during the process. By using nanoparticles for chemotherapy and nano carriers to treat patients, treatments can focus on targeting cancerous cells and limit the damage to healthy cells.
2. **Agriculture: Crop Protection and Livestock Productivity** Nanosized particles can increase crop and livestock productivity. They have the potential to protect plants, monitor plant growth, detect plant and animal diseases, increase global food production, enhance food quality and reduce waste.
3. **Water Treatment: Safe Purification** Scientists and engineers are focused on applying nanotechnology to make water safe and purified.
4. **Diseases: Early Detection** Nanotechnology is applied for early disease detection. Nanoparticles are used to raise a warning or "biomarker" if a cancerous tumor or other disease is found. Early detection of diseases like Alzheimer's and cancer allows treatments and, potentially, a cure to begin sooner.
5. **Energy Storage: Solar Power** Nanoparticles have been shown to enhance the absorption of light, increase the conversion of light to electricity, and provide better thermal storage and transport of Nano technology has the potential to improve solar energy efficiency and reduce costs. As today's researchers continue to make significant advancements across a range of industries, the nanotechnology field is expected to make great strides in the near and long-term future.

## PREPARATION AND ANALYSIS OF 0-3 CONNECTIVITY PZT-PVDF COMPOSITES BY VARYING PRESSURE AND POLING FIELD

S. Gayathiri, P. Gowdhaman, and V. Annamalai\*

Department of Physics, Chikkana Government Arts College, Tirupur, Tamilnadu, India.

\*Email: annamalai\_140795@yahoo.co.in

### Abstract

Various methods have been analyzed and hot press method had been adopted for fabricating PZT-PVDF composites. Pellets with a 2mm thickness and 6.2mm diameter were prepared with 0-3 connectivity using 196, 392, 588 and 784 M Pascal applied pressure. The pellets were poled with 10, 15, 20 kV/cm of applied field. The d33 values were calibrated using TAKE control Piezometer (P35). The g33 values were calculated for the corresponding d33 values. The PZT-PVDF composite morphology have been identified using SEM. The presence of perovskite structure was confirmed using XRD. The purity of the material was found through EDAX. The P-E character study was analyzed using Marine India loop tracer.

**Keywords:** applied pressure, connectivity, composites.

## DENSITY FUNCTIONAL THEORY CALCULATIONS ON STRUCTURES, VIBRATIONAL FREQUENCIES OF 4-FLUORO-3-NITROANISOLE

M. K. Subramanian\*, R. Govindarasu

PG & Research Department of Physics, Thiruvalluvar Government Arts College, Rasipuram, Tamilnadu, India.

\*E-mail: govindras80@gmail.com

### Abstract

This work deals with the vibrational spectroscopy of 4-fluoro-3-Nitroanisole by means of quantum chemical calculations. The FTIR and FT-Raman spectra were measured in the condensed state. The fundamental vibrational frequencies and intensity of vibrational bands were evaluated using density functional theory (DFT) with the standard B3LYP/6-311+G\*\* basis set combinations, and was scaled using various scale factors which yields a good agreement between observed and calculated frequencies. The vibrational spectra were interpreted with the aid of normal coordinate analysis based on scaled quantum mechanical force field. The results of the calculations were applied to simulated infrared and Raman spectra of the title compound, which showed excellent agreement with the observed spectra.

### GREEN SYNTHESIS AND CHARACTERIZATION OF NI DOPED MGO NANOPARTICLES BY SOLUTION COMBUSTION METHOD USING ALOE VERA EXTRACT

Subatra N, Vivekanandhan K\*, Department of Physics, Government arts college, Coimbatore.

\*Email: subanagaraj2105@gmail.com

#### Abstract

**Abstract** The green synthesis of metal oxide nanoparticles through plant extract is simple, eco-friendly, cost effective, and less time consuming. Plant extracts helps in reducing metal ions in the synthesis of nanoparticles. The present study deals with the green synthesis of Ni doped MgO nanoparticles by solution combustion method using Aloe Vera plant extract as a fuel. The structural, morphological and compositional analyses were done by powder X-ray diffraction (XRD), Scanning electron microscopic (SEM) and Energy Dispersive X-ray Spectroscopy (EDAX) respectively. XRD analysis revealed the formation of cubical structure of Ni doped MgO nanoparticles with average particle size of 31nm. SEM images shows stone like spherical structures and agglomerated formations of nanoparticles. EDAX profile confirmed the signal characteristic of Magnesium and nickel. The functional groups and compounds responsible for nanoparticle formation and stabilization were studied by Fourier transform infrared (FT-IR) spectroscopy. The absorption patterns were analysed by UV-visible spectroscopy.

**Keywords:** Green Synthesis, Aloe Vera extract, Ni doped MgO nanoparticles.

### SYNTHESIS AND CHARACTERIZATION OF Mg DOPED TiO<sub>2</sub> NANOPARTICLES BY SOL -GEL METHOD

D.Venugopal, R.Rajeswari, G.Anandhakumari

Department of physics , Gobi Arts & science College (Autonomous), Gobi, India.

Email: gascphy01@gmail.com

#### Abstract

In this study, Pure and Mg-doped TiO<sub>2</sub> nanoparticles, with different ratio of magnesium (0.5 Wt%, 1.0 Wt%) doping contents were prepared by sol -gel method. The prepared Nanoparticles were characterized by X-ray diffraction (XRD), Field Emission Scanning Electron Microscope (FESEM), Energy Dispersive X-ray diffraction (EDAX) and particle size analyzer. XRD patterns of Pure and Mg doped TiO<sub>2</sub> nanoparticles at 400 °C revealed that the crystalline (tetragonal ) structure anatase phase and oriented predominantly to the (101) plane. FESEM for both pure and Mg-doped TiO<sub>2</sub> samples shows both were agglomerated structure. Energy dispersive X-ray analysis conformed the presence of the components Ti, O, Mg and Cl. Particle size analyzer is used to measure the particle size median values from pure TiO<sub>2</sub>, 1% and 0.5% Mg doped TiO<sub>2</sub> nanoparticles are 3.06µm, 0.047µm, and 32.2µm.

**Keywords:** Mg- doped TiO<sub>2</sub> Nanoparticles, Sol-gel method, XRD,FESEM,EDAX and particle size analyzer.

### A DETAIL INVESTIGATION ON STRUCTURAL AND OPTICAL PROPERTIES OF ZNO:SN PREPARED BY CO-PRECIPITATION METHOD

Vijayan .K\*, Leelavathi.R, Vivekanandan K.

Department of Physics, Government Arts College (Autonomous), Coimbatore - 641018.

#### Abstract

ZnO: Sn nanopowders were synthesized by co-precipitation method using zinc acetate dihydrate and tin chloride as a precursors. Co-precipitate of ZnO: Sn nanopowders with pure zinc and different volume fraction of tin chloride (0.250, 0.050, 0.1 %wt) were obtained by calcination process at 500 °C. From the XRD studies revealed that the grain size gradually decreased during increase of the Sn. The transformation of structural properties of the Sn dopant were confirmed by FESEM. From the EDAX result confirm the presence of ZnO and Sn in the nanopowder. From the FT-IR spectra the chemical bonding and the presence of particles of Sn were confirmed. From the UV-Vis spectra the doped Sn increased the band gap than pure zinc were confirmed. From the PL studies blue region of the ZnO: Sn nanopowder were confirmed. These results indicated that the crystallinity and the structural of ZnO nanopowders are significantly affected by Sn dopant.

**Keywords:** ZnO, Tin, ZnO-Sn, co-precipitation method, calcination.

#### Reference:

1. Shalaka C, Navale, I.S. Mulla. Photoluminescence and gas sensing study of nanostructured pure and Sn doped ZnO. Materials science and engineering C. 2009; 29: 1317-1320.
2. Prasoporn Junlabhuta, Wanichaya Mekprasart, Russameeruk Noonuruk Krisana Chongsri, and Wisanu Pecharapa, Energy Procedia 56 ( 2014 ), 560 – 565.

### SYNTHESIS AND CHARACTERISATION OF RARE EARTH BASED NDMNO<sub>3</sub> ELECTRODES FOR PEROVSKITE SOLAR CELLS

D. Sathiyapriya and N. Priyadharsini\*

Department of Physics, PSGR Krishnammal College for Women, Coimbatore, 641 004, Tamil Nadu, India.

\*Email: priyadharsini.natarajan@gmail.com

#### Abstract

Perovskite materials are widely used in the electronic devices due to their interesting physical properties.  $\text{NdMnO}_3$  has the Perovskite structure and is applicable in the magnetic memory storage device. To prepare  $\text{NdMnO}_3$ ,  $\text{Nd}(\text{NO}_3)_3$ ,  $(\text{C}_4\text{H}_6\text{MnO}_4 \cdot 4\text{H}_2\text{O})$  and citric acid are taken as the starting precursors. The compound is synthesized by combustion method which is confirmed through X-ray diffraction. The crystallinity, crystallite size, lattice constants and cell volume have been calculated from XRD analysis. Surface morphology of the sample clearly depicts the uniform formation of clusters of nano particles. The electrical conductivity measurements indicate that  $\text{NdMnO}_3$  have better dielectric properties. It has the antiparallel spin orientation and hence it exhibits the antiferromagnetic property. The Energy Dispersive Spectroscopy analysis gives the chemical composition of the compound. The magnetic measurements were carried out through Vibration Sample Magnetometer. The linear and non-hysteric curve has been obtained from the VSM analysis. The result confirms the antiferromagnetic property of  $\text{NdMnO}_3$  compound. By tuning the bandgap of this perovskite material may emerge out the hybrid type perovskite solarcells.

**Keywords:** perovskite, antiferromagnetic, dielectric, combustion method

## NANOTECHNOLOGY APPLICATIONS IN WATER TREATMENT

Bhuvaneshwari N., Vijayageetha V.A., Annamalai V.

Department of Physics, Chikkanna Government Arts College, Tiruppur, INDIA.

Email: vignesa555@gmail.com

### Abstract

Water is very important role for all the living organisms in day to day life. Due to water contamination 884 million people lack access to adequate potable water and 1.8 million children die every year from diarrhea in the world. At present we are in an urgent need to provide affordable water treatment. Nanomaterial properties desirable for water and waste water applications including high surface area for absorption, high activity for photo catalysis, antimicrobial properties for disinfection, bio fouling control, super paramagnetism for particle separation that find use in novel treatment processes and sensors for water quality monitoring. The following methods of nano adsorbents, carbon nanotubes, nanoparticles and nano membranes are used to purify the water and reuse the waste water. Nano membrane technology is a very effective key component of an integrated water treatment and reuse paradigm.

**Keywords:** water, nanoparticles, nano adsorbents, nano membrane.

## SENSITIVITY ENHANCEMENT OF SURFACE PLASMON RESONANCE SENSOR WITH NOBLE AND MAGNETIC MATERIAL (NI) COVERED 2D MATERIAL

A. Nisha, P. Maheswari, P.M. Anbarasan, K.B. Rajesh\*, Z. Jaroszewicz,

Department of physics, Periyar University, Salem, Tamil Nadu, India

Department of Physics, Chikkanna Government Arts College, Tirupur, Tamil Nadu, India.

Department of physics, PSGR Krishnammal College for Women, Coimbatore. Institute of Applied Optics,

Department of Physical Optics, Warsaw, Poland and National Institute of Telecommunications, Warsaw, Poland

\*Email: rajeskb@gmail.com

### Abstract

In this paper, surface plasmon resonance (SPR) sensor on 2D materials such as TMDCs and graphene on Ag and magnetic material Ni in Kretschmann configuration is analyzed using transfer matrix method. Here we noted that by sandwiching the  $\text{WSe}_2$  layer between Ni film and sensing medium is improved the sensitivity as high as  $298^\circ/\text{RIU}$ . We also noted that the sensitivity of the proposed sensor changes with the addition of no. of layers of graphene and TMDCs materials. We expect that such a high sensitivity SPR sensor could find optional application in chemical examination, medical diagnostic and biological detections

## MAGNETORESISTANCE IN ELECTRODEPOSITED COBALT BASED ALLOYS: INFLUENCE OF MULTINARY ALLOY COMBINATION

R. Rajkumar, K. Antonyraj, M. Ezhil Inban, P. Rajesh, N. Vignesan, P. Gowrishankar

CSIR-National Geophysical Research Institute, Hyderabad, Telangana 500007, India

Department of Physics, Government Arts College, Coimbatore, Tamil Nadu 641018, India

Department of Chemistry, Government Arts College, Coimbatore, Tamil Nadu 641018, India

Hindusthan College of Arts and Science, Coimbatore, Tamil Nadu 641028, India

Email: antonyrajphy@gmail.com

### Abstract

Electrodeposited alloys and multilayers which unveils GMR effect, gained lot of attention in modern technology. This type of films and multilayers has great potential in technological applications, mainly in the field of Magnetoresistive sensors and MEMS devices. In past few years cobalt based magnetic alloys were vastly studied because it offers an interesting magnetic and electrical properties over other alloys. This paper deals with the investigation of preparation and magnetic behavior of electrodeposited cobalt based multinary alloys. Structural and morphological properties of the alloys were confirmed using X-Ray diffractogram and FE-SEM micrographs. Magnetic behavior of the alloys were studied using B-H loop. The magnetoresistive properties were studied using four probe technique. From the investigation it is concluded that the alloys exhibits high crystalline properties with a suitable GMR Effect for the application of Magnetoresistive Sensors.

**Keywords:** Cobalt alloys, Electrodeposition, GMR films, Multinary alloys, Magnetoresistive sensors.

**MECHANICAL CHARACTERIZATION OF AI - 2024 REINFORCED WITH LIME STONE AND GRAPHITE BY STIR CASTING METHOD**

M. Muniyappan, N. Iyandurai\*, P. Duraisamy

Department of Physics Thiruvalluvar Govt. Arts College, Rasipuram - 637 401. Namakkal, India.

Email: ayandurai@rediffmail.com

**Abstract**

Conventional monolithic materials have limitations in achieving good combination of strength, stiffness, toughness and density. To overcome these shortcomings and to meet the ever increasing demand of modern day technology, composites are most promising materials of recent interest. Metal matrix composites (MMCs) possess significantly improved properties including high specific strength; specific modulus, damping capacity and good wear resistance compared to unreinforced alloys. In view of this, the present study focuses on the formation of aluminium-lime stone-graphite hybrid metal matrix composites. The present study was aimed at evaluating some properties of Aluminium 2024 in the presence of lime stone, graphite and its combinations. Consequently aluminium metal matrix composite combines the strength of the reinforcement with the toughness of the matrix to achieve a combination of desirable properties not available in any single conventional material. The compositions were added up to the ultimate level and stir casting method was used for the fabrication of aluminium metal matrix composites. Structural characterization was carried out on metal matrix composites by x-ray diffraction studies and optical microscopy was used for the micro structural studies. The mechanical behaviors of metal matrix composites like density, tensile strength, yield strength, elongation and hardness tests were ascertained by performing carefully designed laboratory experiments that replicate as nearly as possible the service conditions. In the presence of lime stone and graphite [lime stone (5%) + graphite (10%) and graphite (10%) + lime stone (10%)] with aluminium, it was fairly observed that the density of the composites was decreased and the hardness was increased. Correspondingly, the increase in tensile strength was also observed but elongation of the hybrid metal matrix composites in comparison with unreinforced aluminium was decreased. The aluminium- lime stone - graphite hybrid metal matrix composites significantly differed in all of the properties measured. Aluminium in the presence of lime stone (10%)- graphite (10%) was the hardest instead of aluminium- lime stone and aluminium- graphite composites.

**Keywords:** Aluminium 2024, Lime Stone, Graphite, Mechanical characterization

**MODELLING OF A 350MHZ ST-X QUARTZ SAW DELAY LINE DEVICE FOR SENSOR APPLICATIONS**

Dhivya.K.S, Banu Priya R

Department of Physics, Gobi Arts and Science College, Gobi, Tamilnadu-638453.

Email: rithubanu@gmail.com

**Abstract**

Currently worldwide efforts are focused in engineering new sensor materials with novel design structures for improved response characteristics. Although various gas sensing technologies are available in today's time but Surface Acoustic Wave (SAW) based sensors are preferable because of their high sensitivity, room temperature operation and wireless detection. This paper reports on the comparison of three models namely Impulse Response Model, Equivalent Circuit Model and Coupling of Modes Model. The results were used to calculate the insertion loss and bandwidth of SAW delay line using different finger pairs operating at 350 MHZ. The modelling study was carried out using MATLAB as a simulation algorithm. Analysis and modelling will provide insight into the influence of the device design parameters on the sensor performance and help in practical design and optimization of SAW based chemical sensor systems. The result shows that the SAW designs based on three models are adequate for sensor application.

**Keywords:** Surface Acoustic Wave, Interdigital Transducer, Impulse Response Model, Equivalent Circuit Model, Coupling of Modes Model

**PARAMAGNETIC NATURE OF CD DOPED MNO NANOPARTICLES**

G.Kaaviya, P. Monisha, S. S. Gomathi, K. Pushpanathan

Department of Physics, Sri Sarada College for Women, Fairlands, Salem – 636 016, India

Nanomaterials Research Laboratory, Department of Physics, Government Arts College, Karur -639 005, India

Corresponding Author: gomathi1973@gmail.com (+91 9894382887)

**Abstract**

Pure and cadmium doped manganese oxide nanoparticles were synthesized by chemical precipitation method. The magnetic behavior of manganese oxide nanoparticles have wide range of applications in lithium ion batteries. Variety of techniques like XRD, FTIR, UV-VISIBLE, PL, SEM, EDAX and VSM were used to carry out the characterization of the nanoparticles. The structural investigations were done by x-ray diffraction analysis which confirmed the formation of face centred cubic structure. FTIR spectra identifies the functional group present in molecular structure. The band gap energy was calculated from ultraviolet visible spectroscopy which ranges from 3.12 eV to 3.20 eV. Photoluminescence study was carried out to know the occurrence of emission peaks. Morphological study was done by scanning electron microscopy which showed the presence of spherically agglomerated particles. The presence of dopant in the doped samples were found using energy dispersive x-ray measurements. Magnetic properties were studied by vibrating sample magnetometer which exhibits the phase change from ferromagnetic to paramagnetic particles.

**Keywords:** Nanocrystalline; Agglomeration; Spherical; Paramagnetism

**FABRICATION OF DYE SENSITIZED SOLAR CELL OF ZnO NANOPARTICLES USING DIFFERENT NATURAL DYES**

Selva Esakki.E, S.Meenakshi Sundar

PG and Research Department of Physics, Sri Paramakalyani College Alwarkurichi-627412, Tamilnadu, India.

Email: Selvaesakki7270@gmail.com. Ph:9488267270

**Abstract**

Dye Sensitized Solar Cell (DSSCs) were fabricated using different natural flower dyes extracted from Bougainvillea spectabilis, Nerium Olender, and Hibiscus Rosasinesis. The absorption spectra of these dyes have been investigated by UV-VIS spectrophotometry. The advantages of natural dyes include their low cost and availability, environmentally friendly. The sensitization of wide band gap semiconductors using natural pigments is usually ascribed to anthocyanins which belong to the group of natural dyes responsible for several colors in the Red-Blue range found in flowers, leaves and fruits. DSSC were assembled using ZnO nanoparticles. The ZnO nanoparticles is a wide bandgap n-type semiconducting material having transparency in the visible and high infrared reflectivity, good electrochemical stability, acoustics properties. ZnO nanoparticles were prepared by surfactant assisted solvothermal technique from mixed solution of Zinc acetate dihydrate and NaOH at different conditions of pH and used as n-type layer for Dye Sensitized Solar Cell (DSSC) fabrication. In this work, we report the Characterization of ZnO nanoparticle by various technique like Fourier Transform Infra Red Spectroscopy (FTIR), Ultra-Violet and Visible spectroscopy (UV-Vis), Powder X Ray Diffraction (XRD) and ElectroChemical Workstation. X-ray Diffraction analysis of ZnO was found a hexagonal structure with average crystal size (ACS) was found 14nm. In ElectroChemical Workstation Photovoltaic parameters such as short circuit current density ( $J_{sc}$ ), Open Circuit Voltage (Voc), Fill Factor(FF), and Conversion Efficiency for the fabricated cells were determined under 100.

**A DETAIL INVESTIGATION ON STRUCTURAL AND OPTICAL PROPERTIES OF ZnO:Sn PREPARED BY CO-PRECIPITATION METHOD**

Vijayan.K, Leelavathi.R and Vivekanandan K.

Department of Physics, Government Arts College (Autonomous), Coimbatore - 641018.

**Abstract**

Sn nanopowders were synthesized by co-precipitation method using zinc acetate dihydrate and tin chloride as a precursors. Co-precipitate of ZnO: Sn nanopowders with pure zinc and different volume fraction of tin chloride (0.250, 0.050, 0.1 %wt) were obtained by calcination process at 500 °C. From the XRD studies revealed that the grain size gradually decreased during increase of the Sn. The transformation of structural properties of the Sn dopant were confirmed by FESEM. From the EDAX result confirm the presence of ZnO and Sn in the nanopowder. From the FT-IR spectra the chemical bonding and the presence of particles of Sn were confirmed. From the UV-Vis spectra the doped Sn increased the band gap than pure zinc were confirmed. From the PL studies blue region of the ZnO: Sn nanopowder were confirmed. These results indicated that the crystallinity and the structural of ZnO nanopowders are significantly affected by Sn dopant.

**Keywords:** ZnO, Tin, ZnO-Sn, co-precipitation method, calcination.
**STRUCTURAL, MAGNETIC AND DIELECTRIC STUDIES ON Bi<sub>1-x</sub>La<sub>x</sub>MnO<sub>3</sub> NANO CRYSTALLINE THIN FILM**

K.VALLIYAMMAL, A. KALAVATHI, R.SAKTHI SUDAR SARAVANAN

Department of Physics, Nandha Arts And Science College, Erode

Department of Physics, Vellalar College for Women, Erode.

Department of Physics, Chikkanna Government Arts College, Tiruppur.

**Abstract**

BiMnO<sub>3</sub> and Bi<sub>0.8</sub>La<sub>0.2</sub>MnO<sub>3</sub> thin films are grown on Si (400) substrate by using RF magnetron sputtering. The Structural properties of the prepared thin films were analyzed by X-ray Diffraction (XRD) and Scanning Electron Microscopy (SEM) technique. Magnetic properties of the sample were investigated using Vibrating Sample Magnetometer (VSM measurement). Dielectric measurement was also carried out. In the XRD study, the spectra reveal that the grown films are monoclinic in structure with larger grain size and good crystalline nature. The SEM Micrograph of BiMnO<sub>3</sub>:La (20at. %) film shows the existence of uniform growth with the grain sizes are about 100 nm. Magnetic property of the film has been studied using VSM at room temperature and it gives an exact evidence for the existence of ferromagnetism at room temperature. The frequency dependence of the dielectric permittivity ( $\epsilon_r$ ) for our sample has been taken at room temperature. The low value of dielectric constant at higher frequency indicates that these films are suitable for device fabrication. The Bi<sub>0.8</sub>La<sub>0.2</sub>MnO<sub>3</sub>/Si (400) film has better ferromagnetic properties at room temperature and is very much suitable for practical applications.

**Key Words:** Thin film; BiMnO<sub>3</sub>; ferromagnetism; dielectric properties
**SENSITIVITY ENHANCEMENT OF SURFACE PLASMON RESONANCE BASED BIOSENSOR USING COPPER-PLATINUM-TUNGSTEN DISULFIDE-GRAPHENE**

Alagu Vibisha G, Maheswari P, Nishaa A, Rajesh K.B\*

Department of Physics, Chikkanna Government Arts College, Tiruppur, TN, India.

Department of Physics, PSGR Krishnammal College for Women, Coimbatore, TN, India.

Department of Physics, Periyar University, Salem, TN, India. \*Email: rajeskb@gmail.com

**Abstract**

The present theoretical study, an ultra high sensitive surface plasmon resonance based biosensor comprising of Cu-Pt bimetallic layer and WS<sub>2</sub>-graphene hybrid nanostructure. Based on angular interrogation, the proposed biosensor sensitivity is further enhanced by adding WS<sub>2</sub> and graphene layers. Thickness of Cu and Pt as well as the number of WS<sub>2</sub> and graphene layers has been optimized to attain the best sensitivity. The proposed Cu-Pt-WS<sub>2</sub>-graphene modal display highest sensitivity to detect biomolecules.

**Keywords:** Surface plasmon resonance, biosensor, sensitivity, tungsten disulfide, graphene

### PREPARATION AND CHARACTERIZATION OF NIMNCO3O4 THIN FILM FOR HIGH PERFORMANCE SUPERCAPACITOR ELECTRODE

M.Kalyani, R.N.Emerson\*

Department of Physics, Government Arts College, Coimbatore -641018. Email: kal.smily@gmail.com – 9442768832

#### Abstract

The NiMnCo3O4 electrodes prepared by electrodeposition method on copper substrate. The structural, morphological and electrochemical characterizations of the prepared samples studied and confirmed by using of XRD, SEM, EDAX, FTIR and electrochemical measurements. Structural analysis confirms that NiMnCo3O4 film has face centred cubic with polycrystalline nature. Electrochemical measurements proved the NiMnCo3O4 electrode deposited on copper substrate can significantly improve the supercapacitance behaviours. The prepared electrode has observed the high specific capacity of 458 F/g at 10 mV/s. Electrochemical performances were investigated at different scan rate range. And it reveals the prepared electrode has excellent capacitance behaviour as well as reversibility. Moreover, stable cycle capability 79.2% in the capacitance retention was achieved after 3000 cycles. This outstanding electrochemical properties indicate that the obtained NiMnCo3O4 electrode materials are fairly ideal for supercapacitors.

**Keywords:** Thin films, Electrodeposition, Nickel Manganese cobalt ternary oxide, super capacitor.

### SOL-GEL SYNTHESIS AND CHARACTERIZATION OF Cu DOPED TiO<sub>2</sub> NANOPARTICLES WITH ENHANCED OPTICAL AND STRUCTURAL PROPERTIES

A. Pramela, R. Rajeswari, D. Venugopal

Department of Physics, Gobi Arts & Science College, Gobichettipalayam-638453

Email: pramelphysics@gmail.com & Mobile number: 8838071521

#### Abstract

The pure TiO<sub>2</sub> and Cu doped TiO<sub>2</sub> Nanoparticles at different mole ratios (1%, 2% and 5%) were prepared by using sol-gel method. The prepared nanoparticles were calcinated at 450 °C for 2 hours and the nanoparticles were characterized by X-Ray Diffraction (XRD), Field Emission Scanning electron microscopy (FESEM), Energy Dispersive X-Ray Spectroscopy (EDX), UV-Visible spectroscopy (UV-Vis). XRD analysis confirms the formation of anatase titanium dioxide Nanoparticles and the crystalline sizes were increases with increasing the Cu content. FESEM images revealed that the spherical shape with slight agglomeration. EDX analysis confirms the presence of Cu, Ti, O elements. UV-VIS analysis revealed band gap energy of pure and Cu doped TiO<sub>2</sub> Nanoparticles were 2.63, 1.99, 1.88 and 1.45 eV, which improves the photoactive process in the material.

**Keywords:** TiO<sub>2</sub>, Cu doped TiO<sub>2</sub>, Nanoparticles, Sol-Gel method

### INVESTIGATION ON STRUCTURAL AND OPTICAL PARAMETERS OF BISMUTH OXIDE THIN FILMS

Samidurai T, Prabahar S, Karunanithi U, Srikanth S, Karunakaran R.T, Karthikadevi K.

PG & Research Department of Physics, Government Arts College, Udumalpet-642 126, Tamilnadu, India

Email: gacudpt@gmail.com

#### Abstract

Bismuth oxide thin films still prove spectacular to both scientists and engineers owed to their semiconducting performance, large band gap energy and high refractive index, despite of their frequently complex structure, both polymorphic and polycrystalline. The present paper intellect the improvement of semiconductor thin films by Bi<sub>2</sub>O<sub>3</sub>, material prepared by chemical bath deposition technique using Bi(NO<sub>3</sub>)<sub>3</sub> as a precursor followed by bath temperature 80 °C. The Bi<sub>2</sub>O<sub>3</sub> thin film was prepared on glass substrate with pH 12 and varying the time period from 1 to 1.5 hours. Bismuth oxide thin films with energy band gaps ranging from the infrared up to near-ultraviolet region can be obtained, depending on their structure and morphology. The films were characterized by using optical and structural analysis. The dependences of optical individuality of the films on the substrate type and temperature were investigated. Transmittance and absorbance of the Bi<sub>2</sub>O<sub>3</sub> films were measured with ultraviolet and visible light spectrometer. The structural properties of Bi<sub>2</sub>O<sub>3</sub> thin films have been investigated by XRay diffraction method. X-Ray diffraction patterns for CBD Bi<sub>2</sub>O<sub>3</sub> thin films confirm that the peaks are well defined, matched with JCPDS data and exhibiting monoclinic structure. The various structural aspects such as grain size, strain and dislocation density of Bi<sub>2</sub>O<sub>3</sub> films were calculated depending upon thickness and deposition time. The optical energy band gap of Bi<sub>2</sub>O<sub>3</sub> thin films is found to vary from 3.26 to 3.38 eV depending up on deposition time period and thickness. Therefore, Bi<sub>2</sub>O<sub>3</sub> thin films can be used as transparent conducting materials (TCMs) which are widely used in microelectronics, sensor technology, optical coating, transparent ceramic glass manufacturing and Microwave integrated circuit.

**Keywords:** Bi<sub>2</sub>O<sub>3</sub>, Thin Films, Chemical Bath Deposition, Structural and Optical Studies.

### BIOMEDIATED HYDROXYAPATITE NANOPARTICLES USING ACALYPHA INDICA LEAF EXTRACT FOR ANTIBACTERIAL ACTIVITY

R. Leethiyala, J. Praveena, I. Reeta Mary\*

Department of Physics, Government Arts College, Coimbatore, India. \*Email: ireetamary@gmail.com

**Abstract**

Hydroxyapatite is one among the calcium phosphate ceramic materials that has been often used as a bone implant and dental prosthetic material due to its biocompatible and osteoconductive nature. However it possesses poor rheological properties and is inactive against several disease-causing microbes. Henceforth, a green method has been adopted to synthesize multifunctional hydroxyapatite nanoparticles (HNPs) to improve these properties. In the typical process, *Acalypha Indica* Leaves extracted at room temperature with different concentrations were used for the synthesis of HNPs by simple and cost-effective hydrothermal method. The crystallinity and purity of biomediated hydroxyapatite nanoparticles were confirmed by X-ray diffraction and Fourier transform infrared spectroscopy. Field emission scanning electron microscopic images depicted the surface morphology of HNPs whereas Energy dispersive X-ray spectroscopic analysis revealed its elemental composition. The optical studies were done by UV-Visible Spectroscopy. Furthermore, the antibacterial activity of as-prepared HNPs was examined against *Staphylococcus Aureus* by disk diffusion method that elucidated its potentiality in medical and environmental fields.

**Keywords:** Biomediated; *Acalypha Indica*; Antibacterial activity; *Staphylococcus Aureus*.

**SYNTHESIS OF COPPER OXIDE NANOPARTICLES USING THE MIXTURE OF PHYLLANTHUS AMARUS, CENTELLA ASIATICA AND ZIZIPHUS NUMMULARIA LEAF EXTRACT AGAINST ANTICARCINOGENIC ACTIVITIES**

L. Bhuvaneswaran, N. Iyandurai\*

Department of Physics Thiruvalluvar Govt. Arts College, Rasipuram - 637 401. Namakkal, India.

Email: ayandurai@rediffmail.com

**Abstract**

This study aims to present a rationalized study of the main synthesis methods of copper oxide (CuO) nanoparticles in order to obtain tailored nanosystems for various biomedical applications. The synthesis approach significantly impacts the properties of such nanoparticles and these properties in turn have a significant impact on their biomedical applications. CuO nanoparticles have great biological properties including effective antimicrobial action against a wide range of pathogens and also drug resistant bacteria. These properties have led to the development of various approaches with direct applications to the biomedical field. The rapid biological synthesis of copper nanoparticles using leaves extract of *Phyllanthus amarus* (A), *Centella asiatica* (B) *Ziziphus nummularia* (C) and their mixture (A+B+C) provides an environmental friendly, simple and efficient route for synthesis of nanoparticles. The use of plant extracts avoids the usage of harmful and toxic reducing and stabilizing agents. Characterization was done by using a variety of different techniques, mainly drawn from materials science. Scanning electron microscopy (SEM), The Energy-dispersive X-ray spectroscopy (EDX), powder X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR) and ultraviolet spectroscopy (UV) were used for the present study. XRD spectrum confirms the structure of the CuO NPs is monoclinic. It was further observed that the average particle size of the sample was reduced to 16.99 nm when the sample was prepared using the mixture of three plants.

**Keywords:** CuO nanoparticles, *Phyllanthus amarus*, *Centella asiatica*, *Ziziphus nummularia*.

**GRAPHENE BASED SPR BIOSENSOR FOR SENSITIVITY EVALUATION**

K.Kaviyarasi, T.Abiramavalli, S. Subanya, K.B. Rajesh\*

Department of physics, PSGR Krishnammal College for Women, Coimbatore-641 004.

Department of physics, Chikkanna Government Arts College, Tiruppur - 641 602.

\*Email: rajeshkb@gmail.com

**Abstract**

In the recent years, the application of spr based fibre optic sensors have progressed very rapidly. Due to the increase in diseases and diagnostics, the urge for bio sensing applications have drawn the attention of researchers. A detailed numerical analysis on the performance parameter of an optical fibre based SPR sensors with Graphene layers over four different metals Pt/Au/Ag/Cu have been studied. Graphene not only helps in the adsorption of biomolecules due to pi-pi stacking interaction but also prevents metal oxidation. The thickness of the metal layer, its dielectric constants and the thickness, length and refractive index of the sensing layer is properly chosen and the sensitivity evaluation is done. The inclusion of Graphene layer is found to improve the sensitivity of the sensor. The attenuated total internal reflection method along with Krestschmann configuration has been employed for the evaluation. The effects of the metal structures considered and its thicknesses on the transmitted spectrum of the proposed sensor is analysed. Amongst the various chosen combinations, the proposed optimized Platinum Graphene coated SPR sensor demonstrates higher sensitivity than the previously reported spr sensors. The proposed configuration will surely be a promising candidate for high performance bio-sensing applications

**Keywords:** Fiber optic sensors, surface Plasmon resonance, Krestschmann Configuration, dielectric constants, refractive index, sensitivity

**DYE SENSITIZED SOLAR CELL WITH NATURAL DYE EXTRACT FROM BEETROOT**

T.POORNIDEVI, T.VASUKI

Department of Physics, Vellalar College for Women, Erode,

Department of Physics, P.K.R. Arts College for Women, Gobi.

**Abstract**

Solar cells have attracted increasing attention over the last decades. One of the emerging technologies in solar field is Dye Sensitized Solar Cell (DSSC). Dye Sensitized Solar Cells have been extensively used because they offer the advantages of low cost, lower toxicity, environmental friendly and low weight. DSSC is the most promising new generation system for photovoltaic technology. TiO<sub>2</sub> photo electrode is prepared by doctor blade technique and is sensitized using the beetroot extract as a natural sensitizer. The sensitizer is an essential component to absorb sunlight to its extent and convert the incident photons into electric current. With the counter electrode and electrolyte solution, the DSSC is fabricated. The UV and Current-Voltage characteristic has been studied and also the solar power conversion efficiency is found.

**Keywords:** DSSC, FTO glass substrate, TiO<sub>2</sub> electrode, Beetroot Extract, Pt electrode, Electrolyte, Doctor Blade Technique, Ultra-Violet visible spectroscopy (UV), Current-Voltage (I-V) characterization

**PARAMAGNETIC NATURE OF CD DOPED MNO NANOPARTICLES**

G.Kaaviya, P. Monisha, S. S. Gomathi, K. Pushpanathan

Department of Physics, Sri Sarada College for Women, Salem – 636 016, India

Nanomaterials Research Laboratory, Department of Physics, Government Arts College, Karur -639 005, India

Email: gomathi1973@gmail.com (+91 9894382887)

**Abstract**

Pure and cadmium doped manganese oxide nanoparticles were synthesized by chemical precipitation method. The magnetic behavior of manganese oxide nanoparticles have wide range of applications in lithium ion batteries. Variety of techniques like XRD, FTIR, UV-VISIBLE, PL, SEM, EDAX and VSM were used to carry out the characterization of the nanoparticles. The structural investigations were done by x-ray diffraction analysis which confirmed the formation of face centred cubic structure. FTIR spectra identifies the functional group present in molecular structure. The band gap energy was calculated from ultraviolet visible spectroscopy which ranges from 3.12 eV to 3.20 eV. Photoluminescence study was carried out to know the occurrence of emission peaks. Morphological study was done by scanning electron microscopy which showed the presence of spherically agglomerated particles. The presence of dopant in the doped samples were found using energy dispersive x-ray measurements. Magnetic properties were studied by vibrating sample magnetometer which exhibits the phase change from ferromagnetic to paramagnetic particles.

**Keywords:** Nanocrystalline; Agglomeration; Spherical; Paramagnetism

**PROTECTING SENSITIVE DATA ON BIG DATA USING CRYPTOGRAPHIC ALGORITHM WITH QUANTUM PARTICLES**

J.Vimala Roselin, G. M. Nasira

Java Developer, MCi APPS PVT LTD, Bangaluru, Karnataka.

Department of Computer Applications, Chikkanna Government Arts College, Tiruppur-2, Tamilnadu,

Email: roselinmohan@gmail.com; nasiragm99@yahoo.com

**Abstract**

Big Data is enormous volume of both structured and unstructured information that is so expansive it is difficult to process utilizing traditional database and software techniques. The enterprises get the huge data storage by analyzing, preparing the information in the big data platform. Sharing sensitive data is essential to decrease the expense in enterprises. Improvement of security in cloud computing is additionally challengeable when big data, for example, medical and government sensitive data includes in a cloud domain. The managing key for individual user took an interest in the mobile cloud will be the issue when big data is handled without efficient security key management. One way that nanotechnology is being utilized for cyber security is through the exchange of data (sending and receiving). Quantum particles are utilized as cryptographic keys which mask the exchange of data. Quantum cryptography gives a secure method to producing and distributing secret keys between two parties. We present Identity Based Conditional intermediary re-encryption dependent on heterogeneous cipher text transformation and cryptographic algorithm to secure sensitive data viably.

**Keywords:** big data; Quantum particles; Identity-Based Conditional proxy re-encryption; secure sharing; sensitive data;

**DIGITAL FORENSICS AND TEXT SENTIMENT ANALYTICS RETROSPECT ON SOCIAL MEDIA**

R.Hemalatha, K.Devipriya, L.Subathra Devi

PG & Research Dept. of Computer Science, Tiruppur Kumaran College for Women, Tiruppur.

**Abstract**

In the last decade, large number of social media services have emerged and been widely used in people's daily life as important information sharing and acquisition tools. Humans express various emotions when communication with others and these communications can be analyzed to deduce their emotional inclinations. Sentiment analysis can be performed in Social, Medical and industrial applications. This provides an additional layer of information for forensic analysts when investigating suspects. Digital forensics practitioners are in need to establish new forensic process and find novel approaches, methods and tools to maintain the efficiency and performance of their investigations and it examines latest challenges, approaches, methods and tools of digital forensics in the cloud and social network environments, aiming to provide the audience new perspectives and recommendations in the related fields. This paper investigates the problem of sentiment analysis in short messages and the analysis of emotional swings of an individual over time and tool presents an improved approach for identifying mood swings based on short messages sent by subjects shared in social media.

**Keywords:** Sentiment Analysis, Mobile Applications, Digital Forensics, Text Classification, Information Extraction, Social Media Analytics.

**A STUDY ON APPLICATIONS OF NANO TECHNOLOGY IN HEALTH AND MEDICINE**

S.Radhimeenakshi, Associate Professor,  
PG and Research Department of Computer Science P.Kavitha, M.phil Scholar,  
PG and Research Department of Computer Science

**Abstract**

Nano Technology deals with the study and application of very small things with the dimension of 0.1 to 100 nm. These small things can be used across all the science fields in Physics, Chemistry, Engineering, Biology, Material Science and Engineering. In this paper, various benefits and applications of Nano science and technology are analyzed. They can also work in the field of Health and Medicine with the name "Nano Medicine". With the help of Nano Medicine, early detection and prevention of diseases like cancer, Diabetes, CardioVascular diseases, Parkinson's disease, Alzheimer's disease can be made possible and It can provide improved diagnosis, proper treatment and a good follow-up over the disease. Nano Medicine makes use of Nano Biosensors and Nano materials. In Nano devices such as Gold Nano Particles, the DNA segments can be tagged with the gold particles to find the genetic sequence. The damaged tissues can be reproduced or repaired. With the help of Carbon Nano tubes, the Nano Biosensors can be used for astrobiology resulting in the study of origin of life. These can also be used for producing sensors for detecting diseases like cancer. stem cell research by magnetic nanoparticles, intracellular access for sensing biomolecules. Nano technology has a great impact and potential for Health and biomedical applications

**NANO TECHNOLOGY IN MEDICAL IMAGING AND SENSING INSTRUMENTS**

Catherina S. Merlin, Kathirvel D.  
Department of Physics, Chikkanna Government Arts College, Tiruppur.  
Department of Physics, Government Arts College, Coimbatore.

**Abstract**

My Project is the replacement of normal materials & Normal Technology with Nanomaterial & Nanotechnology in Medical Imaging and sensing Instruments like Endoscopy, Colonoscopy, Electro Encephalo Gram, Ultra Sound Imaging, X-Ray, Computer Tomography, Electro Cardio Gram, Laparoscopy, Colonoscopy with advanced Wireless Capsule Endoscopy, NIR Fluorescent Colonoscopy, Electro Encephalo Gram, Ultra Sound Imaging, X-Ray, Computer Tomography, Electro Cardio Gram, Laparoscopy, Colonoscopy for lesser the suffocation of patients & better and accuracy in Results.

**Keywords:** (nanomaterial, Capsule Endoscopy, EEG, ECG, CT. Ultra sound imaging, Laparoscopy, Colonoscopy)

**A COMPREHENSIVE REVIEW ON ZINC SULPHIDE THIN FILMS BY CHEMICAL BATH DEPOSITION TECHNIQUES**

T. Shobana, T. Venkatesan, D. Kathirvel\*  
Department of Physics, Chikkanna Government Arts College, Tiruppur, TN, India.  
Department of Physics, Government Arts College, Coimbatore, TN, India.  
\*Email: kathirvelde@gmail.com

**Abstract**

Synthesis of metal chalcogenides are receiving very wide attention because of their suitability, simplicity and cost-effectiveness for large scale deposition by the selection of suitable chemical methods. Predominantly, thin films technology has led to large scale deposition techniques, even though, using the variety of substrates such as insulators, semiconductor or metal. It has associated with these methods at a lower temperature for reduces chances of oxidation and corrosion of the substrate. Of the various methods available, Chemical Bath Deposition (CBD) method is the one that is used prominently for film deposition mainly for its simplicity and affordability. Moreover, CBD does not require high temperature as well as sophisticated and expensive equipments. Most researchers motivated the metal sulphides. Because, they have a wide range of applications like sensors, modulators, dielectric filters, LEDs, efficient phosphors in flat panel display and buffer layers in the solar cells. In the present paper describes the comprehensive review on the theoretical background necessary for chemical deposition. We discussed the CBD method in details to obtain well-adherent and uniform zinc sulphide (ZnS) thin films. Their bath parameter, structural, morphological, optical, electrical properties etc., are also described.

**Keywords:** Chemical bath deposition, Thin films, Metal Chalcogenides, Zinc Sulphide

**INVESTIGATION ON MICROWAVE SYNTHESIZED ZN(1-X)PBXS TERNARY ALLOY SEMICONDUCTOR NANOPARTICLES**

Gowdhaman P, Sakthi Sudar Saravanan R, Venkatesan T, Haresh M Pandya\*  
Department of Physics, Chikkanna Government Arts College, Tiruppur, Tamilnadu-641 602.  
\*Email: haresh.pandya@rediffmail.com

**Abstract**

Zn(1-x)Pb<sub>x</sub>S ternary alloy semiconductor nanoparticles have been prepared by solvothermal microwave irradiation method. The structural parameters were analyzed using powder X-Ray diffraction (XRD) analysis and the surface morphology was examined using scanning electron microscope (SEM). The energy dispersive X-Ray (EDAX) analysis was carried out to confirm the purity of the nanoparticles. UV-Visible analysis and photoluminescence (PL) studies were performed to investigate the optical characteristics of the prepared sample. From the analyzed results it is revealed that zinc and lead (Pb) forms the separate nucleation as ZnS and PbS at higher fraction of x (say 0.4, 0.5.etc.). This might be due to the larger crystallite size of lead (Pb) and therefor further investigation on these materials will help to obtain a suitable combination of wide band gap nanomaterials.

**Keywords:** Semiconductor Nanoparticles, Ternary Alloy, microwave irradiation method, wide band gap, crystallite size.

### Influence of Heat Treatment on ZnO Thin films for Solar Cell Applications

Valliyammal S., Vijayageetha V.A.\*, Annamalai V.\*, Bhuvaneshwari N.,

\* Department of Physics, Chikkanna Government Arts College, Tiruppur, INDIA. sindhuvali11@gmail.com

#### Abstract

Zinc oxide (ZnO) thin films have been prepared by solvo-thermal method. The prepared films were annealed at different temperatures 280 °C and 380 °C respectively. The structural studies carried out on the annealed ZnO films indicated that the films are nano crystalline in nature with grain size around 26 nm at 380 °C annealed films. The films had wurtzite phase. The scanning electron microscope images of nano crystalline ZnO films show that the films have highly porous structure. The energy dispersive X-ray analysis (EDAX) outcome indicates the presence of Zinc and Oxygen in the samples. The optical band gap has been observed to lie in the range of 3.05 to 2.71 eV. The optical band gap has been identified to decrease with increase in annealing temperature. The ZnO thin films based solar cells have been fabricated. The structures of the fabricated solar cells are FTO/ZnO/electrolyte/Pt electrode. In ZnO solar cells, the 280 °C annealed ZnO thin film solar cells exhibited a power conversion efficiency of 2.85 % with a short circuit current density (J<sub>sc</sub>) of 5.525 (mAcm<sup>-2</sup>), open circuit voltage (V<sub>oc</sub>) of 0.728 (V) and fill factor (FF) 0.876. The 380 °C annealed ZnO thin film solar cells exhibited a power conversion efficiency ( ) of 3.02 % with a short circuit current density (J<sub>sc</sub>) of 6.73 (mAcm<sup>-2</sup>), open circuit voltage (V<sub>oc</sub>) of 0.743(V) and fill factor (FF) 0.881. **Keywords:** solvo-thermal, annealing, electrode, short circuit, current density.

### SYNTHESIS AND CHARACTERIZATION OF PURE AND NICKEL DOPED ZINC OXIDE NANOPARTICLES

Preetha M., Vijayageetha V.A., Annamalai V.\*, Bhuvaneshwari N.

Department of Physics, Chikkanna Government Arts College, Tiruppur, INDIA.

Email: vignesa555@gmail.com

#### Abstract

Zinc oxide and nickel doped zinc oxide nanoparticles are prepared by soft chemical method. zinc oxide is an important II-VI compound semiconductor due to the wide band gap of about 3.3eV and large excitation binding energy of 60 MeV. zinc oxide crystallizes in hexagonal wurtzite structure. The characterization is carried out by using Ultra-Violet spectra, Fourier Transform Infrared Spectra, Photo Luminescence spectra. The room temperature photo luminescence spectra of the samples showed the characteristic peak of zinc oxide nanoparticles. In the FTIR spectra, peaks at 895cm<sup>-1</sup> and 950cm<sup>-1</sup> are observed and confirmed the addition of nickel in zinc oxide lattice. The estimated band gap of pure, one atomic percentage and three atomic percentage nickel doped zinc oxide nanoparticles are 3.67eV, 3.60eV and 3.54eV. Mainly, this paper is focused on the synthesis and characterization of optical properties of pure and nickel doped zinc oxide nanoparticles

**Keywords:** Semiconductor, Band gap, Fourier Transform Infrared Spectra, Photo Luminescence, Ultra-Violet.

### MODELLING OF 100 MHZ SAW FILTER FOR A DIGITAL SIGNAL PROCESSING APPLICATIONS

Venkatesan T.<sup>a</sup>, Banupriya R.<sup>b</sup>, Gowdhaman P.<sup>a</sup>, Haresh M. Pandya<sup>a\*</sup>

<sup>a</sup>Department of Physics, Chikkanna Government Arts College, Tiruppur, TN, India.

<sup>b</sup>Department of Physics, Gobi Arts & Science College, Gobichettipalayam, TN, India.

\* Email: haresh.pandya@rediffmail.com

#### Abstract

Surface Acoustic Wave devices such as delay line, filter, resonator, sensor etc., are widely used in many digital signal processing applications. Of the various SAW devices, the SAW filter is the one that is used prominently for digital signal processing. This paper describes the definition, basic principles, and operation of the finite impulse response (FIR) digital filters. Then, the SAW filter design description process implemented for the designing FIR filter using different windowing functions such as Hamming window, Hanning window function. In this paper, a 100 MHz SAW filter has been designed, modelled and simulated by MATLAB simulation tool. The frequency response of the devices has been graphically as well as numerically obtained and the results were reported.

**Keywords:** SAW Filter, Digital Signal Process, Hanning Window, Hamming Window

### ADVANCEMENTS IN THE DEVELOPMENT OF TiO<sub>2</sub> PHOTOANODES AND ITS FABRICATION METHODS FOR DYE SOLLER CELL APPLICATIONS

Deepha. R, Senthilnathan. V.\*

Department of Physics, Chikkanna Government Arts College, Tiruppur, INDIA.

\*Email: nathas@gmail.com

**Abstract**

Dye sensitized solar cells (DSSCs) are studied for the safe and reliable energy supply. Due to its low fabrication cost, eco-friendly production and competitive efficiency, this is the promising technology. The components of DSSC which combine to form a photo conversion device are the conducting substrate, dye, photoanode, catalyst and electrolyte. Each component has its own importance but among them photoanode is probability the main component which determines the energy conversion efficiency. Various photoanode materials have been trialled to date. Among them Zn and  $\text{TiO}_2$  are widely recognized, researched and investigated. In this review attempt will be made to examine the strategies to improve the efficiency of  $\text{TiO}_2$  photoanode.

**STRUCTURAL, SURFACE AND OPTICAL PROPERTIES OF NANOSTRUCTURED HYDROXYAPATITE BUNDLES FOR PHOTODEGRADATION OF METHYLENE BLUE DYE**

I. Reeta Marya,<sup>a</sup>, S. Jaipriyab, P. Sekarb, D. Mangalaraja, C. Viswanathana and N. Ponpandiana\*

Department of Nanoscience and Technology, Bharathiar University, Coimbatore, India.

Department of Physics, Government Arts College, Coimbatore, India.

\*E-Mail: ponpandian@buc.edu.in (N. Ponpandian)

**Abstract**

The physical and chemical properties of biomaterials typically depend on their size, morphology, specific surface area, etc., due to which they find diverse application in various fields. However, fabricating biocompatible nanostructured materials with desired morphologies using appropriate eco-friendly method has become an exigent issue. Hydroxyapatite (HAp) is one such biocompatible biomaterial that finds a wide range of application owing to their exceptional biocompatibility, osteoconductivity and adsorption/desorption properties. However, development of self-assembled hydroxyapatite nanostructures is a challenging issue amidst the materialists. Hence, an attempt has been made to synthesis nanostructured Hydroxyapatite bundles via a lucrative solvothermal process without using any surfactant. The fabricated HAp bundles were structurally analyzed using X-ray diffraction and Fourier transform infrared spectroscopy that confirmed the purity of the samples. The morphological analysis was established by Field emission scanning electron microscopy whereas its optical characteristics by UV-Visible analysis. Further, the synthesized HAp bundles were investigated for the photodegradation of methylene blue dye under UV irradiation.

**Keywords:** Biocompatible; self-assembled; photodegradation; methylene blue dye.

**SYNTHESIS AND CHARACTERISATION OF HYDROXYAPATITE NANO PARTICLES**

\*D. Kathirvel, S. Jayaram

Department of Physics, Government Arts College, Coimbatore TN, India.

\*E-Mail: kathirvelde@gmail.com

**Abstract**

Hydroxyapatite ( $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$ , HA), one of the major mineral constituents of vertebrate bone and tooth, is the most well-known crystalline phase of calcium phosphate (CaP). In general, HA is an important synthetic biomaterial which is under considerable investigation for many decades due to its similarity with the mammalian hard tissue. Hydroxyapatite HAp ( $\text{Ca}_{10}(\text{OH})_2(\text{PO}_4)_6$ ) nano particles with various dopants are synthesis by co-precipitation method. Powder XRD analysis has been carried out to find purity and crystalline nature of the substance. FTIR spectroscopy confirms the various functional groups present in the material. Optical properties are studied by uv-vis spectroscopy. Hence the prepared material is good for repairing bone defects and bone augmentation due to its superior biocompatibility, osteoconductivity, and bioactivity.

**Keywords:** Co-precipitation, Hydroxyapatite Nano particles

**STRUCTURAL AND MORPHOLOGICAL CHARACTERIZATION OF TIN BASED TERNARY ALLOYS**

M.MOHANASRI, M.REKA, M.EZHIL INBAN, P. RAJESH, K.ANTONYRAJ, N.VIGNESAN

Department of Physics, Government arts College, Coimbatore

Department of chemistry, Government arts College, Coimbatore

Email: mohana16sulur@gmail.com

**Abstract**

This paper is devoted to synthesis Ternary alloyson copper substrate with sulphate bath using electrodeposition technique. For many years researchers are dealing with Co based magnetic alloys due to its noteworthymagnetic properties in present work we made an attempt to study an alternate alloy combinationwith tin and its magnetic behavior. Themorphology, structural and constituents in the films were studied and confirmed by employing SEM, XRD and EDAX analysis. Structural studies reveals the crystalline nature in the films. Themorphology of the deposits confirms the formation of uniform and bright deposition. Also the obtained EDAX pattern confirms the presence relevant peaks. From the investigation it is concluded that tin plays a major role in both structural and morphological properties as expected.

**Keywords:** Electrodeposition, Tin alloys, Magnetic alloys, magnetic properties.

**STRUCTURAL AND ANTIMICROBIAL INVESTIGATIONS OF COPPER (II) CHLORIDE ADDED NANO-HYDROXYAPATITE**

A. NISHARA BEGUM \*, M. TAMILCHEZHIAN , S. ARAVINDAN, C. DEEPA  
 Department of Physics, Chikkaiah Naicker College, Erode – 638004  
 PG department of Physics, Government Arts College (Autonomous), Salem - 636007

#### Abstract

The field of biomaterials acknowledges the significance of using inorganic/organic components to design unique model of Biomaterials. Here, the metal and metal oxide incorporated implants gain importance towards development of orthopedic and dental prostheses due to their immense mechanical features, biocompatibility and corrosion resistance. Hydroxyapatite (HAp) is one of most important mineral forms of calcium phosphate with specific Ca-P ratio, resembles the apatite nature of human bone system. In the present work, an attempt has been made to synthesis additive free and Cu incorporated n-HAp using wet chemical method. Five different samples in various amount of Cu as 0, 10, 25, 50 and 75 wt% (respectively named as C0H, C10H, C25H, C50H and C75H) were synthesized. The properties of n-HAp samples with and without additives were characterized and analyzed by XRD, SEM-EDAX and antimicrobial analysis. The observed XRD result illustrate the inability of copper additives in altering the structural stability of crystalline n-HAp. The inclusion of Cu<sup>2+</sup> with n-HAp has not made any significant changes in its surface morphology. Still, it favours the particle agglomeration and porosity of the synthesised n-HAp. The observed elemental values in EDAX analysis reveals the retaining of their concentration at reasonable strength with negligible variations, despite the increase of Cu<sup>2+</sup> concentration. The n-HAp samples show the substantial antimicrobial responses against the bacterial strains, Gram-negative Klebsiella pneumonia and Gram-positive Staphylococcus. The surface occupied Cu<sup>2+</sup> ions facilitates suppression of bacterial strains and thereby restricted their inhibition zones.

#### DYE SENSITIZED SOLAR CELL WITH NATURAL DYE EXTRACT FROM ROSA DAMASCENA

Shilpa D\*, Dr.T.Vasuki \*  
 Department of Physics, P.K.R. Arts College for women, Gobichettipalayam.

#### Abstract

Solar cells play a vital role for the last decades. One of the interesting and emerging solar cell type is Dye Sensitized Solar Cells (DSSC). DSSC is one of the third generation of solar cells. The advantages of this DSSC are low cost, lower toxicity manufacturing process, low weight, and the potential to use in flexible panels as compared to p-n junction devices. Dye sensitized solar cells (DSSCs) based on natural dyes extracted from Rosa damascena flowers were fabricated. The TiO<sub>2</sub> paste is formed from TiO<sub>2</sub> powder. This paste is coated on FTO glass substrate by Sol-gel spin coated technique. The coated FTO glass is dried and annealed at 450 degree Celsius. Now the dye is extracted from the Rosa damascena. The coated FTO glass is sensitized in this dye and dried. This is processed into a solar cell by using an electrode (FTO) and an electrolyte (Triiodide).

**Keywords:** FTO glass electrode, Rosa damascene dye, TiO<sub>2</sub>, electrolyte(Triiodide).Sol-gel spin coating.

#### SYNTHESIS AND CHARACTERISATION OF CUPRIC OXIDE (CuO) THIN FILMS BY CHEMICAL BATH DEPOSITION METHOD

P.METHUNAVATHANI\*, RADHIKA.V\*  
 Department of Physics, P.K.R. Arts College for Women. Gobichettipalayam.Tamilnadu.  
 Email: radhikaviswanath@gmail.com

#### Abstract

Thin films of Cupric Oxide (CuO) are synthesized on the glass slides by chemical bath deposition method. The precursor is prepared by using Copper Nitrate salt and small amount of Polyvinyl Pyrrolidone and Sodium Hydroxide solution. Then the glass slides are coated with this precursor by the chemical bath deposition method, which are then analyzed by various techniques like XRD, SEM, and FTIR.

**Keywords:** Cupric oxide thin films, Chemical bath deposition

#### SYNTHESIS,GROWTH AND CHARACTERIZATION OF GLYCINE DOPED WITH POTTASSI POTTASIUMCHLORIDE A SINGLE CRYSTAL

P.Bharathi1,N.Dineshkumar  
 Department of Physics, Gobi Arts and Science College, Gobichettipalayam,Tamilnadu

#### Abstract

Glycine doped with potassium chloride is grown from aqueous solution by slow evaporation method.The grown crystals were subjected to X-ray powder diffraction analysis.The X-ray powder diffraction study,the peaks observed for different diffraction planes exist in the indexed and lattice parameters were determined.powder XRD spectrum of as grown crystals reveals that the crystals is hexagonal,FTIR is used determine the functional group of the crystal.Optical studies of the grown crystals,exhibit wide transparency window which is suitable for second harmonic generation.

## SYNTHESIS ,GROWTH AND CHARACTERIZATION OF L-ALANINE MONOHYDRATE DOPED WITH CADMIUM ACETATE A SINGLE CRYSTAL

Sindhuja.R,Valarmathi.P  
Department of Physics, Gobi, Tamil Nadu, India.

### Abstract

The single crystal of L-alanine doped with cadmium acetate material has been grown from aqueous solution by slow solvent evaporation method at room temperature. L-alanine and cadmium acetate material were mixed in the molar ratio of 1:1. From the XRD study the peaks observed for different diffraction planes exist in the crystal were indexed and the lattice parameters were determined. Powder XRD spectrum of the grown crystal reveals monoclinic system. The various functional groups of the grown crystal were identified by FTIR spectroscopic analysis. The UV spectrum was recorded and the absorption peak was observed.

## FAULT DETECTION AND ANALYSIS OF TRANSMISSION LINE USING MATLAB SIMULINK

A.Ashibaparveen, R.Balan\*  
Department of Physics, Chikkana Government Arts College, Tiruppur, Tamilnadu.  
Email:balanphy@yahoo.co.in

### Abstract

Electrical fault is the deviation of voltages and currents from nominal values or states. Under normal operating condition, power system equipment or lines carry normal voltages and currents which results in a safer operation of the system. But when fault occurs, it causes excessively high currents to flow which causes the damage to equipments and devices. Fault detection and analysis is necessary to select or design suitable switchgear equipments, electromechanical relays, circuit breakers and other protection devices. This work approaches to the MATLAB software in which transmission line model is designed and fault Analysis for different sorts of faults has been done. Its impacts are appeared in simulation output, for example, voltage, current, control alongside the positive, negative and zero sequence segments of voltage and current output as far as waveforms.

**Keywords:** Simulink, Three phase, Power systems, L-L –Line to Line fault, Single Line to Ground fault, 2L-G Double Line to Ground fault

## STRUCTURAL , SPECTROSCOPIC , OPTICAL AND MECHANICAL STUDIES OF L-PROLINUM TARTRATE CRYSTALS

V.Divya, K.Janani, F.Helen, Kanchana  
Govt. Arts College, Coimbatore.

### Abstract

L-Proline tartrate single crystals have been grown by slow evaporation method. Powder XRD analysis has been carried out to find purity and crystalline nature of the grown crystal. FTIR spectroscopy confirms the various functional groups present in the material. The optical properties of the crystal are studied by Uv-Vis spectroscopy. Photoluminescence study reveals the blue fluorescence emission of LPT crystals. The energy band gap of LPT is also determined. Microhardness study confirms LPT is a hard material. Hence the material is a potential candidate for optical application.

## GREEN SYNTHESIS AND CHARACTERIZATION OF MGO NANOPARTICLES BY SOLUTION COMBUSTION METHOD USING ALOE VERA EXTRACT

Sheeba Veronica J, Subatra N\*,  
Department of Physics, P.K.R. Arts College for Women, Gobichettipalayam, Tamil Nadu  
Email :sheebavero23@gmail.com

### Abstract

The metal oxide nano particles have a wide range of applications. Here it is focused on the green synthesis of MgO nano particles using aloe vera extract. Synthesis of these metal oxides can be done in an environment friendly and non toxic manner. The precursor used is  $Mg(NO_3)_2 \cdot 6H_2O$ . The present study deals with the green synthesis of MgO nanoparticles by solution combustion method using Aloe Vera plant extract as a fuel. The structural, and compositional analyses were done by powder X-ray diffraction (XRD), and Energy Dispersive X-ray Spectroscopy (EDAX) respectively. XRD analysis revealed the formation of MgO nano particles. The synthesized nano particles were characterized by XRD, FTIR. The functional groups and compounds responsible for nanoparticle formation and stabilization were studied by Fourier transform infrared (FT-IR) spectroscopy.

**Keywords:** Green Synthesis, Aloe Vera extract, MgO nano particles.

## A REVIEW ON CERAMIC-POLYMER COMPOSITE

G.Mythily, V.Annamalai\*  
Department of physics, Chikkanna Government Arts College, Tiruppur, TN, India  
Email:annamalai\_140795@yahoo.co.in

### Abstract

Piezoelectric materials are decisive in sensor technology. In this paper the development of piezoelectric sensors and materials are studied. The piezoelectric and ferroelectric properties of PZT ceramic materials were also discussed. This review paper includes the comparison of piezoelectric ceramic-polymer composite sensors on the basis of connectivity of whole phases. The trending materials for sensor application are disputed. This study is proposed for further development in the area of piezoelectric sensors.

**Key words:** Piezoelectricity, ferroelectricity, piezoelectric ceramics, sensors, PZT, piezoelectric composites, connectivity.

### SYNTHESIS, GROWTH AND CHARACTERIZATION OF THIOUREA DOPED WITH POTASSIUM NITRATE

M.Sunmathi, N.Dineshkumar

Department of Physics, Gobi Arts and Science College, Gobi, Tamilnadu

#### Abstract

The single crystal of Thiourea doped with potassium nitrate crystal grown from aqueous solution by slow evaporation method. The crystal structure and atomic spacing are determined by X-ray diffraction method reveals at the crystal structure was monoclinic. Functional groups of the grown crystal were identified by FTIR spectroscopic analysis. The UV-visible spectrum was recorded and the absorption peak was observed around 244nm. The mechanical properties of the grown crystal was studied by micro hardness test.

### OPTICAL TRAPPING AND MANIPULATION OF MAGNETIC PARTICLES

S.Mohammed Imran, M.Udhayakumar, K.B. Rajesh\*, J. William Charles, Haresh.M. Pandya

Department of Physics, Chikkanna Government Arts College, Tiruppur, Tamilnadu, India

E-Mail: rajeskb@gmail.com

#### Abstract

Based on Inverse Faraday Effect, the three dimensional magnetization field distribution induced by the tightly focused azimuthally polarized beams through a cosine phase masks are investigated theoretically by vector diffraction theory. Results shows that an azimuthally polarized beam with radial cosine wave front phase is tightly focused, the focal pattern differs considerably with frequency parameter in the cosine function term. We noted that increasing the value of frequency parameter in the cosine part of the phase mask, focal shift may occur, simultaneously, the focal shift direction may change. Many novel focal patterns also evolve considerably, such as from one magnetization spot to two magnetization spot and shifting of same is also observed. Such a tunable focal shift can be used to construct controllable optical trapping and manipulation of magnetic particle.

**Keywords:** Inverse Faraday Effect, High NA lens, Cosine phase plate, azimuthally polarized beam.

### MODULATING FOCAL STRUCTURES WITH PAIR OF VORTICES

M.Mayilsamy, D.ThiruArul, K.B.Rajesh\*, J. William Charles, Haresh.M.Pandya

Department of Physics, Chikkanna Government Arts College, Tiruppur, Tamilnadu, India

Email: rajeskb@gmail.com

#### Abstract

In this article, the tight focusing properties of circularly polarized Gaussian beam with a nested pair of vortices through a uniaxial birefringent crystal are investigated numerically by vectorial Debye theory. It is observed that proper manipulation of position between the vortex Pair, birefringence  $[\Delta n]$  generates novel focal patterns including confined focal spot, focal hole, splitted focal spot, and focal shift focus of sub wavelength scale are generated.

**Keywords:** Uniaxial birefringent crystal; circularly polarized laser; Pair of vortices.

### SYNTHESIS GROWTH AND CHARACTERIZATION OF L-ALANINE DOPED WITH THIOPHENE A SINGLE CRYSTAL

B.Nithya, N.Dineshkumar

Department of physics, Gobi Arts and Science College, Gobichettipalayam, Tamilnadu

#### Abstract

The pure L-ALANINE doped with THIOPHENE single crystals were grown successfully by slow evaporation method at room temperature. The concentration of dopant in the mother solution was 4.4 ml. There is a change in unit cell. The fourier transform infrared spectroscopy study confirms the incorporation of L-alanine into thiophene crystal. The doped crystals are optically better and more transparent than the pure ones. The mechanical property of the grown crystal was determined by micro hardness method. The grown crystals were also subjected to thermal and NLO studies.

### ADVANCED DEVELOPEMENT OF COMMUNICATION DEVICES USING RADIO FREQUENCY WAVES

S. ARUNPRASATH1, R. BALAN\*,

Department of Physics, Chikkanna Government Arts College, Tiruppur, Tamil Nadu.

\*Email: balanphy@yahoo.co.in

#### Abstract

Infrared technology holds great potential for accessing variety of information resources. Already IR (infrared) is commonly used in remote of TV'S and CD players, since they can transmit a lot of data simultaneously because they are high frequency but they have some limitations like line of sight. This was overcome by converting IR to RF (radio frequency) because they can travel for long distance and through the obstacles. We can use this conversion for long distance communication and also detecting IR from long distance.

**Keywords:** TSOP (Thin Small Outline Package), ASK (Amplitude Shift Keying) Hybrid RF Transmitter and Receiver Pair, Communication.

### Cadmium Sulfide nanoparticles for Laser Safety Devices

G. Prakash and T.C.Sabari Girisun\*

Department of Physics, Bharathidasan University, Tiruchirappalli-620024, Tamilnadu, India

\*E-Mail:sabarigirisun@bdu.ac.in

#### Abstract

In recent years, various research on cadmium sulfide nanoparticles are undertaken which can be widely used for many potential applications like photo resistor, sensors, solar cells and so on. Mono-dispersed cadmium sulfide (CdS) nanoparticle were synthesized by a simple wet chemical method by using thiourea as capping agent. The prepared CdS nanoparticle were confirmed through XRD and Raman analysis. The observed peaks were matched with standard JCPDS (10-0454) and peak at  $26.66^\circ$  ( $2\theta$ ) corresponds to (1 1 1) plane of CdS which confirms the formation of cubic structure of CdS. The Raman vibrational modes of CdS arises at 300  $\text{cm}^{-1}$  and 600  $\text{cm}^{-1}$  which further confirms the CdS formation. Third-order nonlinear optical properties of CdS NPs were studied by Z-scan technique using Nd-YAG laser (1064nm, 9ns, 10Hz). CdS exhibit two photon absorption with 2PA co-efficient of  $\beta = 3.5 \times 10^{-10} \text{ m}^2/\text{W}$  and exhibit excellent optical limiting action with limiting threshold of  $6.84 \times 10^{11} \text{ W/m}^2$ . Hence CdS nanoparticle can be used as potential candidate for protecting optical components from damages induced by intense 1064 nm laser radiation. Reference: 1. N. Venkatram and D. Narayana Rao, Nonlinear absorption, scattering and optical limiting studies of CdS nanoparticles, Optics Express, 2005, 13, 867. 2. Jianxi yao, Gaoling zhao and Gaorong Han, Synthesis and characterization of the thiourea-capped CdS nanoparticles, Journal of Materials Science Letters, 2003, 22, 1491.

### NANOSTRUCTURED ZINC OXIDE: SYNTHESIS AND CHARACTERIZATION FOR ANTIBACTERIAL ACTIVITY AGAINST ESCHERICHIA COLI

A. Yuvarani, R. Vaideeswaran, R. Devaraj, I. Reeta Mary\*

Department of Physics, Government Arts College, Coimbatore, India.

\*Email: ireetamary@gmail.com (I. Reeta Mary))

#### Abstract

Recently, metal oxide nanostructures are of prime focus for intense scientific and engineering research owing to their wide array of application in biomedical, optical and electronic fields. It is evident that surface modified metal oxide nanostructures reveal notable biocidal action against various bacteria. Among them, Zinc Oxide (ZnO) is best exploited at nanoscale dimensions for antibacterial activity over a wide spectrum of bacterial species. Accordingly, the present work was focused to synthesize nanostructured ZnO by facile and cost-effective hydrothermal method where the size and morphology of the nanoparticles can be controlled under mild synthetic conditions. An attempt was made to elucidate the effect of reaction time on the morphology of ZnO nanoparticles. As-prepared ZnO nanoparticles were structurally characterized by X-Ray Diffraction (XRD) and Fourier Transform Infrared Spectroscopy (FTIR) to reveal the crystallinity and purity of the samples; Surface characterization was done by Scanning Electron Microscopy (SEM) and the optical characterization by UV-Visible Spectroscopy (UV-Vis). Besides, the antibacterial efficacy of the nanostructured ZnO against Escherichia Coli by disk diffusion method was also investigated.

**Keywords:** Biocidal; antibacterial activity; hydrothermal; Escherichia Coli.

### SYNTHESIS GROWTH AND CHARACTERIZATION OF THIOUREA DOPED WITH POTTASIAM CHLORIDE A SINGLE CRYSTAL

R.sathya, N.Dineshkumar

Department of physics, Gobi Arts and Science College, Gobi

#### Abstract

The single crystal of thiourea pottasiam chloride is grown from slow evaporation method at room temperature. The crystal is formed in the ratio of 1:1. The grown crystal was harvested after 30 days of synthesis. The XRD (xray diffraction method) is shows that the grown crystals exhibits crystalline nature "triclinic in shape". The FTIR technique confirmed the functional group of the grown crystal. From the FTIR spectrum studies the wave number range from 400-4000  $\text{cm}^{-1}$  is observed. The optical behaviours of the crystals are studied by uv-visible studies. The thiourea pottasiam chloride crystal has a good transmittance of the entire visible region.

### ENERGY HARVESTING FROM CERAMIC AND POLYMER COMPOSITES

T.Ramya, S.Sathiyapriya, V.Annamalai\*

Department of Physics, Chikkanna Government Arts College, Tiruppur, TN, India.

E-Mail:annamalai\_140795@yahoo.co.in

**Abstract**

Piezoelectric materials have been in use for many years. Piezoelectricity has gained significant importance in research and development for extracting energy from the environment. In this work, the voltage responses of ceramic based composite structures and polymer based piezoelectric materials were evaluated when subjected to various pressures. This kind of subjected pressures leads to investigate the possibility of energy generation.

**Keywords :** Piezoelectricity, ceramics, polymers, Energy generation.

**PREPARATION AND CHARACTERISATION OF CARBON QUANTUM DOTS FROM GLUCOSE AND TURMERIC POWDER**

A.Niveth, P.Hemalatha

**Abstract**

Glucose and Turmeric powder were being used for the preparation of Carbon Dots. 4g of Glucose with 40ml of distilled water had undergone Hydrothermal treatment for 12hrs at 170°C, the obtained solution was centrifuged, washed and re-dispersed in water, dried and sonicated to obtain a solution of Carbon Dots of varying sizes. 0.3g of Turmeric powder with 30ml of Ethanol and 60ml of water were heated at 80°C for 30mins. The product was hydrothermally treated for 12hrs at 200°C. Then the product was filtered and centrifuged to obtain Carbon Dots. The presence of Carbon Dots and their luminescence were investigated by using UV-VIS and PL studies. The morphological characteristics of the obtained Carbon Dots were studied by XRD and Raman Spectroscopy. The results were found to be in agreement with previous reports.

**Keywords:** C-Dots, Glucose, Turmeric, Hydrothermal

**CLASSIFICATION AND TESTING OF SOIL TYPES FROM VARIOUS PLACES**

D.S.SONIYA\*, RADHIKA. V\*

Department of Physics, P.K.R. Arts College For Women. Gobichettipalayam. Tamilnadu.

\*Email: radhikaviswanath@gmail.com

**Abstract**

Soil which is the most important natural resources on earth, is made up of air, water, minerals and organic materials. Soil has an important role in agriculture, filtering and purifying water. Different areas are chosen in Erode district which are Anthiyur, Bhavanisagar, Bungalowpudur, Nambiyur, Kodivery and Koravampalayam. Soil is collected from these places and tested for its fertility. The analysis may be helpful for agriculture, which remains the backbone of our country.

**Keywords:** soil, types, nutrients, minerals, resources

**SYNTHESIS AND CHARACTERISATION OF CARBON QUANTUM DOTS FROM NATURAL RESOURCES**

K.S.Sujith Lal, P.Hemalatha

**Abstract**

Carbon Dots were synthesized from different materials as coconut shell and Orange juice. Powdered Coconut shell of 2g with 50ml of water and 40ml of Orange juice with 30ml of Ethanol separately had undergone hydrothermal treatment at 200°C and 120°C for 3hrs and 2.5hrs respectively. The products were then centrifuged for 15 minutes and excess amount of acetone was added to Orange Juice and again centrifuged for 15 min to obtain the Carbon Quantum Dots. The UV-VIS and PL studies confirmed the presence of Carbon Dots and their luminescence were investigated. The XRD and Raman studies gave the morphological characteristics of the obtained Carbon Dots. The results were in agreement with previous reports.

**Keywords:** Carbon Dots, Coconut Shell, Orange Juice, Luminescence.

**GREEN SYNTHESIS OF CADMIUM OXIDE NANO PARTICLE FROM SENNA AURICULATA**

SANTHIYA.C, GAYATHRI.S\*, GOWDHAMAN.P \*, V.ANNAMALAI\*

Department Of Physics, PKR Arts College For Women, Gobichettipalayam.

\*Email: gayathiri1992@gmail.com

**Abstract**

Among several methods, green synthesis of Cadmium oxide nanoparticles was done using the flower extract of Senna Auriculata as a precursor flower extract. Nanoparticles produced by flower extract are more stable and the rate of synthesis is faster. Thus obtained flower extract was mixed with 0.1M solution of Cadmium Chloride. In this process Cadmium Oxide nanoparticles are obtained in powder form and could be send for Fourier transforms Infrared spectroscopy (FTIR) and UV- Visible absorption spectroscopy and X-Ray diffraction.

**Keywords:** Cadmium chloride, Senna Auriculata, synthesis, FTIR, X-ray.

**A STUDY OF PZT-PVDF COMPOSITE WITH PIEZOELECTRIC CHARACTERISTIC**

R.Saranya, C.Karthick, G.Vinothkumar,V. Annamalai\*  
Department of Physics, Chikkanna Government Arts College, Tiruppur, TN, India  
\*Email:annamalai\_140795@yahoo.co.in

#### Abstract

PZT-PVDF materials have been used to fabricate a composite as a pellet using hot pressure apparatus. XRD were used to analyze the structure of composite. EDAX have been utilized to know the purity percentage of material. TAKE control piezometer has been used to study the capacitance and strain coefficient. The coercive field and magnetic induction have been plotted using P-E hysteresis loop device.

**Keywords:** Composite, Piezometer, Hysteresis

### SYNTHESIS AND CHARACTERIZATION OF CALCIUM OXIDE NANO PARTICLES BY CO-PRECIIPITATION METHOD

GAAVIYAA.S.R\*, RADHIKA.V\*  
Department of Physics, P.K.R. Arts College for Women, Gobichettipalayam, Tamilnadu.  
\*E-Mail: radhikaviswanath@gmail.com

#### Abstract

Preparation of calcium oxide (CaO) Nano particles is carried out by co-precipitation method. Calcium oxide(CaO) Nano particles is synthesized by using calcium nitrate as a initializing agent and Triethanolamine(TEA) which acts as a complexing agent with 0.1M of hydrazine hydrate. The characterization techniques, including XRD and TEM and UVanalysis are taken for the prepared Nano particles.

**Keywords:** CaO, TEA complexing agent, co-precipitation.

### GROWTH AND CHARACTERIZATION OF SUCCINIC ACID DOPED L-THREONINE CRYSTAL

G.SRIJAA , P.KARTHIGA DEVI .  
Department of Physics, Government arts college, Coimbatore.  
Mail id: srijaagunasekaran@gmail.com

#### Abstract

Nonlinear optical (NLO) single crystal of succinic acid doped l-threonine crystal was grown by slow evaporation solution growth technique at room temperature. The cell parameters of the grown crystal were estimated by single crystal X-ray diffraction analysis. The presence of functional groups was identified from Fourier transform infrared spectrum. The transmission spectrum of this crystal shows that the lower cut of wavelength lies at 310 nm. The relative second harmonic generation has been carried out by Kurtz powder technique in order to confirm its second harmonic generation efficiency.

**Keywords:** Crystal Growth, Slow evaporation, second harmonic generation.

### GROWTH AND CHARACTERISATION OF TRIGLYCINESULPHATE (TGS) SINGLE CRYSTAL DOPED WITH NiSO<sub>4</sub>

DHARINI. R, RADHIKA. V\*  
Department of Physics, P.K.R. Arts College for Women, Gobichettipalayam, Tamilnadu.  
\*Email: radhikaviswanath@gmail.com

#### Abstract

Synthesis of TGS crystal is done using slow evaporation method. Glycine is dissolved with Sulphuric acid in distilled water and the solution is doped with NiSO<sub>4</sub>. Now the required crystal is grown. XRD analysis is done for the grown crystal for structural characterization along with optical analysis.

**Keywords:** TGS, triglycinesulphate NiSO<sub>4</sub> doping, slow evaporation

### ENGINEERING SUB WAVELENGTH SCALE 3D FOCAL STRUCTURES USING SPECIALLY DESIGNED PHASE FILTER

D.Thiruarul, R.Vetrivel, M.Udhayakumar, K.B.Rajesh\*, J.William Charles, Haresh. M. Pandya  
Department of Physics, Chikkanna Government Arts College, Tiruppur, Tamilnadu, India  
\*Email: rajeshkb@gmail.com

#### Abstract

Based on vector diffraction Theory the tight focusing properties of azimuthally polarized Bessel Gaussian beam (APBGB), phase modulated by annular Walsh function filters and focused by a high NA lens system is studied numerically. A diffraction-limited 3D isotropic multiple focal hole segment is obtained by properly tuning the Walsh order(N), annular obstruction( $\epsilon$ ) and beam parameter  $\beta$ . We assume that such multiple focal hole patterns may find applications in trapping of low refractive index particles, fluorescence microscopy etc.

**Keywords:** Annular Walsh Filters, High NA lens, APBGB.

### INFLUENCE OF IN<sub>2</sub>O<sub>3</sub> DOPANT ON THE PROPERTIES OF V<sub>2</sub>O<sub>5</sub> THIN FILMS PREPARED BY VACUUM DEPOSITION ONITO SUBSTRATES

P. Yuvaraj, Anil Midathada, T.S. Senthil, Richards Joshua, S. Pavithra, A. Priya, A. Neelaveni, N. Sivakumar\*  
 Department of Physics, ChikkaiahNaicker College, Erode, Tamilnadu 638004, India  
 Fujairah Men's College, Higher College of Technology (HCT), P.O.Box: 4114, Fujairah, United Arab Emirates  
 Department of Physics, Erode Sengunthar Engineering College, Perundurai, Erode, Tamilnadu, 638057, India.  
 \*Email: nskdnp@gmail.com; Mobile: 9384454698

#### Abstract

The vacuum deposition coating is a promising route to acquire In<sub>2</sub>O<sub>3</sub> doped vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>) thin films on ITO substrate at 300 °C with the vacuum condition of 5.7×10<sup>-5</sup> torr. Influence of In<sub>2</sub>O<sub>3</sub> doping (3, 6 and 9 wt. %) on structural, morphological, optical and DC electrical conductivity of (V<sub>2</sub>O<sub>5</sub>) thin films were measured by various characterization techniques. XRD analysis confirms the formation of polycrystalline orthorhombic structure with preferential orientation of (0 0 1) plane. The surface morphology has been carried out using FE-SEM, and the image reveal, the particle size was decreases with the dopant of In<sub>2</sub>O<sub>3</sub>. The elemental confirmation has been done by using EDAX for both pure and In<sub>2</sub>O<sub>3</sub> doped V<sub>2</sub>O<sub>5</sub>. After In<sub>2</sub>O<sub>3</sub> doping, the grain size was decreased and grain boundaries increased as the scattering center of lights increased which has been confirmed by UV. From the UV result, the optical bandgap energy decreases from 3.9 to 3.6 eV. From the electrical studies, it has been confirmed that the resistance of the prepared films were decreased with increase in In<sub>2</sub>O<sub>3</sub> doping concentrations. The Raman study indicates that, the shifting of 1088 cm<sup>-1</sup> band to 1080 cm<sup>-1</sup> for the doped In<sub>2</sub>O<sub>3</sub> in V<sub>2</sub>O<sub>5</sub> which represent the lengthening of O-V-O bond.

**Keywords:** vacuum deposition technique; vanadium oxide; structural, Optical & electrical properties

### STUDY OF CYCLONES ON SOUTH INDIAN REGION DURING 2010 – 2018

M.Priyadharshini, T.Venkatesan, P.Gowdhaman, Haresh M.Pandya\*  
 Department Of Physics Chikkanna Government Arts College., Tirupur, Tamilnadu, India.  
 \*Email:haresh.pandya@rediffmail.com

#### Abstract

Tropical cyclones are low pressure system that form over warm tropical water and have force winds. Tropical cyclone characteristics like wind speed, pressure, wind pressure have been analysed from the research study over a decade. Mathematical relations were collected to analyse the characteristics of the cyclones formed during 2010 – 2018. In this paper describes the computational analysis of the tropical cyclones characteristics using the MATLAB simulation software. A MATLAB algorithm generates computational results and compared with existing cyclone characteristics. The developed MATLAB algorithm will be useful for the prediction of cyclone in future days.

### SYNTHESIZE AND CHARACTERIZATION OF Cu,Ni DOPED ZnO NANOPARTICLES

M.Anushya, A.Bhagavathi, R.Dhanalakshmi, S.Indhumathi, N.Krishnaveni, M.Syed Vajeelha, S.Murali Krishnan, M.Sudalai mani, S.MeenakshiSundar  
 Department of physics, Sri Paramakalyani College, Alwarkurichi, Tirunelveli.

#### Abstract

ZnO nanoparticles are the semiconductor materials having band gap energy 3.37 eV and very large excitation binding energy (60meV) at room temperature. Also it is non toxic environmental friendly and transparent to visible range of spectrum. In the present investigation copper doped zinc oxide nanoparticles are synthesized by solvothermal technique at different pH value in between 4 and 9 (four samples) using zinc acetate and sodium hydroxide and HCl as precursors and Ethylene glycol as solvent. Nickel doped zinc oxide nanoparticles are synthesized by solvothermal technique at four different mass ratios. The structure and morphology of prepared zinc oxide nanoparticles was characterized for structure using X-Ray diffraction (XRD) spectroscopy and UV visible spectrum shows the transparency of nanoparticles over entire visible range. The FTIR analysis confirms the formation of ZnO nanoparticles. Photoluminescence, Photocatalytic, Electron spin resonance and Vibrating sample magnetometer studies will be taken.

**Keywords:** ZnO nanoparticles, solvo-thermal, UV visible, FTIR.

### EFFECT OF ADIPIC ACID ON ELECTROCHEMICAL PROPERTIES OF Li<sub>3</sub>V<sub>2</sub> (PO<sub>4</sub>)<sub>3</sub> AS CATHODE MATERIAL FOR RECHARGEABLE LITHIUM-ION BATTERIES

A. Priya, Anil Midathada, T.S. Senthil, P. Yuvaraj, Richards Joshua, S. Pavithra, A. Neelaveni, N. Sivakumar\*  
 Department of Physics, ChikkaiahNaicker College, Erode, Tamilnadu 638004, India  
 Fujairah Men's College, Higher College of Technology (HCT), P.O.Box: 4114, Fujairah, United Arab Emirates.  
 Department of Physics, Erode Sengunthar Engineering College, Perundurai, Erode, Tamilnadu, 638057, India.  
 \*Email: nskdnp@gmail.com; Mobile: 9384454698

#### Abstract

The monoclinic  $\text{Li}_3\text{V}_2(\text{PO}_4)_3$  powders were synthesized by solid state route with different calcination temperature of 800, 900 and 1000 °C for 10 h in Ar atmosphere in which adipic acid used as a chelating agent. The influence of calcination temperatures of carbon coated  $\text{Li}_3\text{V}_2(\text{PO}_4)_3$  has been investigated using X-ray diffraction (XRD) and electrochemical methods. The crystalline phase formation was investigated using thermogravimetric-differential thermal analysis (TG-DTA). Among the optimized conditions, the sample prepared with 0.15 molar ratio of adipic acid to total metal ions at the calcination temperature of 900 °C showed a better electrochemical performance compared to other samples. The capacity retention of the  $\text{Li}_3\text{V}_2(\text{PO}_4)_3 + 0.15$  molar ratio of adipic acid sample is 92% after 20 cycles, whereas it is only 85% for pure  $\text{Li}_3\text{V}_2(\text{PO}_4)_3$  sample. Keywords:  $\text{Li}_3\text{V}_2(\text{PO}_4)_3$ , adipic acid, solid state route, Lithium-ion batteries, carbon-coating.

### STUDIES ON GREEN SYNTHESIS OF CARBON NANOPARTICLES USING MURRAYA KOENIGII SHOOTS

Mohanapriya S, Narmatha N, Sathyapriya P and Kavitha B\*  
Department of Physics, Sri G.V.G Visalakshi College for Women, Udumalpet.  
\*Email: kavitha.sudharsan@gmail.com

#### Abstract

The synthesis of Carbon nanoparticles (CNPs) have been employed using naturally occurring and easily available material of *Murraya Koenigii* (curry tree) shoots in the presence of castor oil. The prepared Carbon nanoparticles (CNPs) were characterised using X-ray diffraction, Scanning electron microscope (SEM), Fourier transform infrared spectroscopy (FTIR) and UV-Visible Spectrophotometer (UV) analysis. The XRD analysis results confirmed the crystal structure of carbon nano-materials in association with hexagonal graphite lattice. SEM images of Carbon nanoparticles showed that the prepared nanoparticles are roughly surface with uniformly distributed. FT-IR spectral analysis revealed the characteristics peaks of Carbon Asymmetric stretching. The UV visible spectrum exhibits a well defined absorption spectra of carbon nanoparticles peak in 250-300 nm and these peaks represent the typical absorption of an aromatic pi system. This method provided a simple and efficient route to the synthesis of carbon nanoparticles. Furthermore, these carbon nanoparticles could have large numbers of potential applications in the field of high electron mobility, Bioimaging and Biomedical applications.

**Keywords:** Carbon nanoparticles, XRD, SEM, FTIR, absorbance spectra.

### NANOSATELLITE COMMUNICATION SYSTEM TRENDS

Mr. M.H.FAIZALAHAMAD, E-Mail: j.elstak@isispace.nl

#### Abstract

This paper discusses the rise of nano-satellite communication capabilities over the last years and establishes an outlook of what can be expected of future systems. There has been a steady rise in performance of small spacecraft in all shapes and sizes recently. This growth has mainly been driven by the miniaturisation and increase in capabilities of the available electronic components but also by the requirements of more complex missions and payloads. The trend in growth of capabilities has been well characterised over the years for conventional and more recently small satellites. The paper will use example mission to illustrate the performance trends, starting from flight proven early CubeSat missions up to current. Furthermore, new ground segment architectures are emerging, taking advantage of ground station networks and actually increasing the downlink capabilities of new satellites and modifying the trade-off between high speed / low coverage and lower speed / higher coverage.

### GREEN SYNTHESIS OF COPPER NANOPARTICLES USING OCIMUM SANCTUM AND PIPER NIGRUM

M.Nirmala\*, S. Nasreen, S. Kiruthika, B. Divya, E. Manochitra  
Department of Physics, Sri GVG Visalakshi College for Women, Udumalpet.

#### Abstract

Synthesis of nanostructural materials using plant leaf extract is an eco-friendly, non-toxic and cost efficient approach in the field of nanotechnology. In this study, biosynthesis of stable copper nanoparticles were prepared by using *Ocimum sanctum* and *piper nigrum* extract. These biosynthesized Cu nanoparticles were characterized with the help of X-ray diffraction (XRD), Scanning Electron Microscopy (SEM) and Fourier transform infrared spectroscopy (FTIR). The crystalline size of the Copper Nanoparticles prepared from Tulsi extract is little smaller than Copper nanoparticles prepared from Pepper extract. SEM images of Copper nanoparticles showed that the cluster formation presence of smaller and larger grains. FTIR analysis revealed that the functional groups present in the Copper nanoparticles prepared from both Tulsi and Pepper extract. Thus, this method can be used for rapid and ecofriendly biosynthesis of stable copper nanoparticles and can be used for catalytic agent, anti-microbial, anti-fungal, anti-biotic, nanosensor, super conducting material, Solar cell applications.

**Keywords:** *Ocimum Sanctum*-Tulsi, *Piper Nigrum*-Pepper, Diffraction, Green synthesis, Copper

### SYNTHESIS AND CHARACTERIZATION OF MAGNETIC MICROSPHERES LOADED WITH ANTICANCER DRUGS FOR DRUG RELEASE

AJITHKUMAR C., Department Of Physics Chikkanna Govt aArts Collage Tirupur-02

#### Abstract

Biodegradable polylactide (PLA) microspheres containing magnetic nanoparticles (MNPs) and antiinflammatory drug Ibuprofen (IBF) were synthesized by using emulsion solvent evaporation technology. With surface modification, the magnetic nanoparticles/PLA composite drug carriers showed excellent magnetite content and magnetic susceptibility. SEM and TEM showed that the magnetic microspheres were spherical in shape with a smooth surface, and of a mean diameter in the micrometer range. The incorporation of MNPs and IBF into the PLA matrix was confirmed by FTIR. XRD and VSM further confirmed the existence of MNPs in the microspheres which maintained superparamagnetic behavior with a saturation magnetization of 31.4 emu/g. The magnetite content of 28.4 wt% was assessed by TGA. In addition, the drug release profiles showed that the IBF-loaded PLA magnetic microspheres are pH-induced release of IBF and are promising for controlled release drug delivery.

### PREPARATION AND CHARACTERISTICS OF SPIN COATED CdS THIN FILMS

Kalpana K, Pavithra N, Shalini S, Stanoabarna M and Kavitha B\*  
Department of Physics, Sri G.V.G Visalakshi College for Women, Udumalpet.  
\*Email: kavitha.sudharsan@gmail.com

#### Abstract

Cadmium sulphide thin films were deposited on glass substrates using Spin Coating technique. The structural, optical and surface morphologies and bond formation of CdS thin films were investigated by X-ray diffraction (XRD Analysis), Optical Analysis, Scanning Electron Microscopy (SEM) and Fourier Transform Infrared Spectroscopy (FTIR). XRD analysis reveals that prepared thin films are polycrystalline in nature with hexagonal structure having the preferential orientation along (002) plane. The crystallite size, dislocation density, lattice constants and thickness of thin films were estimated. The surface morphology shows that the grain size of CdS thin films are in the range from 5 to 0.2 micrometers. The optical band gap energy ( $E_g$ ) was calculated from transmittance spectra about 2.23 eV. CdS bond formation was analyzed from FTIR spectroscopy.

**Keywords:** CdS thin films, XRD, SEM, FTIR, transmittance spectra

### BIOSENSORS IN NANOTECHNOLOGY

S.NANDHINIDEVI, Email: nigarilakd25699@gmail.com,

#### Abstract

This paper discusses the rise of nano-satellite communication capabilities over the last years and establishes an outlook of what can be expected of future systems. There has been a steady rise in performance of small spacecraft in all shapes and sizes recently. This growth has mainly been driven by the miniaturisation and increase in capabilities of the available electronic components but also by the requirements of more complex missions and payloads. The trend in growth of capabilities has been well characterised over the years for conventional and more recently small satellites. The paper will use example mission to illustrate the performance trends, starting from flight proven early CubeSat missions up to current. Furthermore, new ground segment architectures are emerging, taking advantage of ground station networks and actually increasing the downlink capabilities of new satellites and modifying the trade-off between high speed / low coverage and lower speed / higher coverage.

### BUCKYPAPER MADE OF CARBON NANOTUBES

M.PRAVEEN, Email: mpraveenlc113@gmail.com

#### Abstract

This paper discusses the rise of nano-satellite communication capabilities over the last years and establishes an outlook of what can be expected of future systems. There has been a steady rise in performance of small spacecraft in all shapes and sizes recently. This growth has mainly been driven by the miniaturisation and increase in capabilities of the available electronic components but also by the requirements of more complex missions and payloads. The trend in growth of capabilities has been well characterised over the years for conventional and more recently small satellites. The paper will use example mission to illustrate the performance trends, starting from flight proven early CubeSat missions up to current. Furthermore, new ground segment architectures are emerging, taking advantage of ground station networks and actually increasing the downlink capabilities of new satellites and modifying the trade-off between high speed / low coverage and lower speed / higher coverage.

### ONE STEP SIMPLE HYDROTHERMAL SYNTHESIS AND CHARACTERIZATION OF RARE-EARTH MOLYBDATE ( $\text{REMOO}_4$ ) NANOMATERIALS FOR OPTOELECTRONIC APPLICATIONS

P. Mahaalakshmi, G. Sahaya Dennish Babu, Manuel E,  
Department of Computer Science and Engineering, Chettinad College of Engineering and Technology, Karur – 639 114  
Department of Physics, Chettinad College of Engineering and Technology, Karur – 639 114,  
Departamento de Fisica, Universidad de La Laguna, E-38206, Spain.  
Email: dennishbabu@chettinadtech.ac.in

#### Abstract

Recently, rare earth ion doped molybdate ( $\text{REMoO}_4$ ) compounds have been considered as one of the important upconversion functional nanomaterials for energy related applications<sup>1</sup>. These compounds exhibit interesting fluorescent, ferroelectric, ferroelastic and non-linear optical properties, which are very suitable for various optoelectronic applications<sup>2</sup>. In the present investigation, nanoparticles of  $\text{NaLa}_x\text{Sm}_{1-x}\text{MoO}_4$  were successfully synthesized by oleic acid assisted hydrothermal method at 200 °C for 18h. The structural properties of the rare earth molybdates were analyzed by powder diffraction and transmission electron microscope techniques. It shows that the prepared nanoparticles are having scheelite type with tetragonal crystal structure. The average crystallite sizes of the nanoparticles are of 70-80 nm which was calculated from Debye-Scherrer formulae. Spherical and rice shaped nanoparticles were analyzed by high resolution transmission electron microscope and their elemental composition was achieved by energy dispersive spectrometer (EDS). X-ray photoelectron spectroscopy studies confirm the oxidation states of the elements present in the material. Details will be presented.

**Keywords:** Rare earth molybdates, hydrothermal, LED, ferroelectric materials

## NANOTECHNOLOGY AND ITS APPLICATIONS IN MEDICINE

Mr.D.HITESH, Email:hitesh7845@gmail.com

### Abstract

This paper discusses the rise of nano-satellite communication capabilities over the last years and establishes an outlook of what can be expected of future systems. There has been a steady rise in performance of small spacecraft in all shapes and sizes recently. This growth has mainly been driven by the miniaturisation and increase in capabilities of the available electronic components but also by the requirements of more complex missions and payloads. The trend in growth of capabilities has been well characterised over the years for conventional and more recently small satellites. The paper will use example mission to illustrate the performance trends, starting from flight proven early CubeSat missions up to current. Furthermore, new ground segment architectures are emerging, taking advantage of ground station networks and actually increasing the downlink capabilities of new satellites and modifying the trade-off between high speed / low coverage and lower speed / higher coverage.

## FUTURE NANOTECHNOLOGY DEVELOPMENTS FOR AUTOMOTIVE APPLICATIONS

P.SAMBATHKUMAR, Email: sunthiru0838@gmail.com,

### Abstract

In the automotive industry, nanotechnology applications are manifold. They reach from power train, light-weight construction, energy conversion, pollution sensing and reduction, interior cooling, wear reduction, driving dynamics, surveillance control, up to recycle potential and much more. Additionally, visions of “nano in cars” reach from contributions for CO<sub>2</sub>-free engines, safe driving, quiet cars, self-healing body and windscreens, up to a mood-depending choice of colour and a self-forming car body. All this will meet the present society trends and customer demands for improved ecology, safety and comfort, often summarised by the term sustainability. For automotive components nanoparticles, -dots, -pores, -fibers, -tubes, -whisker, -layers, either dispersed within a matrix material and called “nanocomposites”, or arranged on surfaces or used as a discrete material and then called “nanostructures”, offer exclusive potential. Volume effects like diffusion, absorption and mechanical strength might be tailored, furthermore surface effects like adsorption, hardness, and catalytic reaction. Selforganisation of structures will play an essential role in growth, deposition and etching. We will present an overview about existing nanotechnologies in cars already on the market, applications with short-term and medium-term potential as well as long-term applications such as light-weight construction using nano-carbon nanotubes which are presently investigated in research labs worldwide and have a high potential if they can be used for automotive bodies.

## EVALUATION OF MODERN DIGITAL INTERACTIVE LEARNING STRATEGIES IN PRE GRADUATE STUDENTS USING DATA MINING ALGORITHM

A. Kovalan, G. M. Nasira

Manonmaniam Sundaranar University, Tirunelveli.

Department of Computer Applications, Chikkanna Government College, Tirupur.

### Abstract

The expanding volume of data generally makes a challenge for the need of investigating information that finds regularities in this information. Data Mining has emerged tools for analysis of data, the discovery of hidden knowledge, and decision making in many application domains. Educational system is one of these application domains. The Education system should be evaluated and enhance the educational service organizations to improve the quality of their services and satisfy the need of customers. This study investigates and legitimizes the importance of Data Mining in assessing students' performance in online course materials in a real-world education system, through predicting the probability of accomplishment and analyzing the student data and find out the effectiveness of online courses which help the online educational service organization. Academic performance of our student is a major problem in an Educational Institution and developed a predictive model using conventional methods do not deliver high accuracy results because of gigantic measures of data, the connection between characteristics, missing qualities, and non-linearity of variables, whereas, Data Mining techniques function admirably with these conditions. The objective of this study is to assess the student's academic performance using Data Mining techniques. The result of the analysis exhibit how extracted learning assists in enhancing decision making processes. The scope of this study is to recognize the components that impact the students to choose the materials of online courses in pre-graduate education. The predictive tool apparatuses and strategies will be adjusted to anticipate the students' attitudes and their performance so as to decide the students' decision in choosing the higher education. An early expectation of student performance makes a move for better accomplishments of the student. To accomplish standard quality

education, a few attempts have been made to anticipate the performance of the student. Particularly Prediction Techniques, Using data mining tools, such as Recommender System and Content-Based Filtering Algorithms help in enhancing the quality of the online course materials by evaluating student data to predict the student performance in the courses. And also study the effectiveness of integrated technology in creative writing through life oriented inquiry curriculum in the context of teaching and learning of English and Many schools in India, started to teach through modern digital technology. The qualitative research study was used to investigate teachers' readiness to integrate technology at the middle stage in Tamilnadu, India. An experimental method was found to be a true most appropriate method for testing the hypothesis in the study. Technology-based learning package deals with two sensory methods viz. Appearance & sound, which helps learners to be confident, innovative, creative and informative. Control Group (CG) and Experimental Group (EG) will assign the forty students at random for each group. The students of the control group will be asked to develop an imaginary design with paper-based materials while those of the experimental group will be asked to do the same with the help of simple basic knowledge of computer technology. The scores of the students of CG and EG will be tabulated and analyzed using appropriate statistical techniques. Formulated hypotheses will also be tested with availing appropriate statistical tools. Based on the findings of the study, it is concluded that the integrated technology for creative writing techniques is effective in bringing about a holistic development of the linguistic skills of the students. It is also concluded that there is a difference amongst the students in terms of their creative writing with respect to technology enhancement, integration of technology, students' assessment and ease of implementation.

**Keywords:** Data mining, Online Course Materials, Technology, Integration, Creative Writing.

### A STUDY ON COMPUTER MEMORY IMPROVEMENTS WITH NANOTECHNOLOGY

S.Jayasankari, Department of Computer Science, P.K.R Arts College for Women (Autonomous), Gobichettipalayam.  
Email:jayasankaris@pkrarts.org

#### Abstract

Today the nanotechnology integrated with computer and hard drives used as memory in computers consume more power and have more chance of failure than solid state memory that doesn't have any moving parts. For that reason, solid-state computer memory has become popular on smaller computers, such as tablets. This solid-state computer memory take up less space, uses less battery power, and is less likely to be damaged if the device is dropped. Nanotechnology is being used to improve the density of solid-state computer memory. This study projected to use vertical flash transistors. The idea is that by making the transistors vertically memory cells could be stacked on top of each other, with the potential for increasing the memory density. The proposed system based computer memory cell density could be 8 to 16 times higher than for planar transistors. Applying a current they can move the magnetized sections along the length of the wire. As the magnetized sections move along the wire, the data is read from the memory using stationary sensor.

**Keywords:** Nanotechnology, Transistors, Magnetized sections, Stationary sensor, Computer.

### DATA COLLECTION USING GROVE-PI SENSOR INTERFACE TO RASPBERRY-PI AND WIRELESS TRANSMISSION TO UBUNTU LAPTOP USING ZIGBEE

M. Raghavendra, Department of Computer Science Engineering, SIT, Tumkur Karnataka 572103.  
Email: rag.sit.cse@gmail.com

#### Abstract

Grove Pi Sensors are connected to Grove Pi Interface board. This interface board will fit to top of the Raspberry pi single chip computer. The grove pi sensors will sense the sensor data and it is collected by grove pi board, which will be fed to Raspberry pi. Python program will process these sensor data and output log is generated. The same data is wirelessly transmitted to Ubuntu system using Zigbee.

### GREEN SYNTHESIS AND CHARACTERIZATION OF HYDROXYAPATITE NANOPARTICLES

N.Vidhya, K.Surya, V.Kalaiselvi, R.Mathammal.  
Department of Physics, Navarasam Arts&Science college for women, Erode.  
Department of Physics, Sri Sarada college for women, Salem, Tamilnadu,India.  
Email: nk.arthi.kalai@gmail.com, vidhyasivam3@gmail.com.

#### Abstract

Hydroxyapatite (HAp) is a well known biomaterial applied in orthopaedic and dental application as bone implants. Bone can easily be infected by microorganisms. In the present study, HAp nanoparticles are capped with Kedrostis foetidissima leaf extract (KHAp) by wet chemical assisted microwave irradiation using calcium hydroxide as calcium source and orthophosphoric acid as phosphorous source. The synthesized samples were characterised by XRD, FTIR, UV, SEM, EDAX and PL. Further invitro analysis was performed using gram positive bacteria Staphylococcus aureus and Bacillus subtilis. Gram negative Pseudomonas aeruginosa and Escherichia coli, candida albicans fungi, X-ray diffraction (XRD) analysis investigated the crystalline size as 20.04nm for pure HAp and 16.71 nm for KHAp. FTIR spectrum confirms the presence of hydroxyl (O-H) and phosphate (PO<sub>4</sub><sup>3-</sup>) groups. UV and PL analysis reveals the band gap energy of 4.06eV. The emission band of KHAp is at 385.91nm. SEM and EDAX predict the spherical shaped morphology with proper proportion of 1.65. Invitro analysis reveals the significant zone of inhibition for both bacteria and fungi.

**Keywords:** Hydroxyapatite, green synthesis, Kedrostis foetidissima, invitro.

### SYNTHESIS AND CHARACTERISATION OF INORGANIC ACID DOPED CONDUCTING POLYMER

Gayathridhandapani , R.Balan  
Department of Physics,Chikkanna government arts college,Tiruppur.  
Email: gayathridhandapani123@gmail.com

#### Abstract

Conducting polymeric materials containing conjugated bonds have attracted much interest in scientific and technological areas in recent years. The unique optical, electrical and chemical properties offer these materials to be used in electronic displays, telecommunication, biosensors, anti-corrosion coatings and etc. On comparing with polyaniline, poly ortho toluidine have attracted considerable attention as they exhibit better solubility in wide range of solvents. Poly (o-toluidine) (POT) was synthesized by chemical oxidative polymerisation technique by using sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) as protonisation agent and ammonium peroxy disulfate (APS) as oxidizing agent .The optical, structural, morphological and size of particles have been investigated. X-ray diffraction showed that the POT is a partially crystalline polymer due to doping of highly concentrated sulfuric acid. A flaky like feature was observed via scanning electron micrograph(SEM). Better protonation effect of POT was indicated by UV spectroscopy. Chemical structure of POT was investigated by FT-IR. Nano particle size analysis displays that the synthesized POT has good result because the particle size is below than 100 nm.

**Keywords:** POT, FT-IR, optical and structural properties, SEM, Particle size.

### NATURAL RADIOACTIVITY MEASUREMENTS ON RIVER SAND AND MANUFACTURED SAND IN CAUVERY RIVER BELT, TAMILNADU, INDIA.

S. Gnanasaravanan , P. Rajkumar  
Department of Physics, Kadhira Mohideen College, Thanjavur. Tamilnadu, India.  
b Department of Physics, A.A. Government Arts College, Musiri, Tiruchirappalli - 621201, Tamilnadu, India.  
Email: sg.saravanan80@gmail.com; rajkumarrspm@gmail.com

#### Abstract

The study about the distribution of the radioactivity presence in natural and artificial materials enables one to assess any possible radiological hazard to humankind by the use of such materials. The major objective of this study is to analyze the natural radioactive level and mineral characteristics of the River Sand (R-Sand) samples from Cauvery river belt and manufactured sand (M-Sand) samples around Cauvery River belt, Tamilnadu, India. The radioactive characterizations of the samples have been studied using gamma ray spectrometer. The activity concentrations of the studied samples are within the world and Indian average values. Absorbed dose rate, annual effective dose rate (both indoor and outdoor), Radium Equivalent (Raeq), Hazard Indices (Hin, Hex and Iyr ), Radioactive Heat Production (RHP) rate, Excess Lifetime Cancer Risk (ELCR) and Activity Utilization Index were also calculated. Apart, observed dose rate is also measured. All the obtained results are discussed and it is found that M – sand has more benefit than the R – sand in the aspects of radiological characterization.

**EXTRACTION PROFILE OF TI BY TBP-HNO<sub>3</sub>**

Rajalakshmi.P\*, Radhika.V\*

Department of Chemistry, P.K.R. Arts College for Women, Gobichetipalayam.

\*Email: rajalakshmimsc09@gmail.com

**Abstract**

Extraction profile of Ti by pre-equilibrated TBP (TBP-HNO<sub>3</sub>) was studied under simulated condition with un-irradiated Y<sub>2</sub>O<sub>3</sub> pellet dissolver solution in Ti pressure vessel. Extractions were done for 3 times. Based on the KD it is predicted that after proposed 8 extractions <3% of Ti will remain in the aq. Phase which is well below the permissible limits as recommended by IAEA for human consumption of <sup>89</sup>SrCl<sub>2</sub>.

**Keywords:** Extraction profile, TBP-HNO<sub>3</sub>, Ti, <sup>89</sup>SrCl<sub>2</sub>

**GROWTH AND CHARACTERIZATION OF IMIDAZOLE LITHIUM CHLORIDE (ILC) SEMI ORGANIC NONLINEAR SINGLE CRYSTAL**N. Sekar\*, R.Abinaya, S. Mahalekshmi, M. S. Mohamed Hussain, S. Nagasunder and A. N. Vighneswaran  
Bharathidasan University, Tiruchirappalli, 620 024, India 2

Department of Physics, Khadir Mohideen College, Adirampattinam, 614701, India

\*Email; nsekar.kmc@gmail.com

**Abstract**

The sample was synthesized by taking AR grade Imidazole and Lithium Chloride in 1:1 stoichiometric ratio. The component salts were dissolved in demonized water and mixed thoroughly using a magnetic stirrer at room temperature. On evaporating the solvent at 50°C the synthesized salt was obtained. The purity of the synthesized salt was improved by successive recrystallization process. The solubility of ILC crystal in water linearly increases with temperature. Slow evaporation technique is adopted to grow the crystal during the period of 25 days. Nonlinear effects (ie) multi-photon effects of such as frequency doubling in a crystal, e.g. the output of a Nd:YAG laser at 1064 nm pumping a KTP crystal for an output of 532 nm was investigated. The work hardening coefficient for the grown crystal is 3.71. As the crystal is hard materials n lies between 1 and 1.7 was calculated.

**Keywords;** ILC crystals, Imidazole, hardening coefficient and soft materials

**SMALL ANGLE X-RAY SCATTERING IN THIN IRON FILMS**

G.Arumugam, Department of physics, annai vailankanni Arts and Science College, Thanjavur

Email:goviarumugam82@gmail.com

**Abstract**

By small angle X-ray scattering (SAXA) and atomic force microscopy characteristic sizes are determined, structural features of thin iron films deposited by magnetron evaporation onto substrates from py-roceramics are established. It is shown that morphologically the film is characterized by disorder. It is formed columnar Nano crystallites that are oriented either perpendicular to the substrate or situated in its plane, which dictates polydispersity of those coatings. It is shown that SAXS may be thought of as nondestructive technique for analyzing structure and composition and conducting quality control of magnetron films.

**Keywords:** Small angle X-ray scattering, Atomic force, Scanning electron, Digital holographic microscopy, thin magnetron films.

**PREPARATION AND CHARACTERIZATION OF CD<sub>2</sub>SnO<sub>4</sub> OF THIN FILMS BY USING JET NEBULIZER TECHNIQUE**S. Naseema Banu, G. Prabhavathi, S. Abinaya, G. Jessi Freska, A. Ayeshamariam\*  
Bharathidasan University, Thiruchirappalli, 620 025, India

Department of Physics, Khadir Mohideen College, Adirampattinam, 614701, India

\*Email; aamariam786@gmail.com

**Abstract**

Cadmium Oxide film doped with tin oxide thin film was prepared by Jet nebulizer technique and it was annealed to 200° C normal to the substrate, the lattice parameters values were orthorhombic because of doping of tin oxide it was varied from its original cubic structure. The carrier concentration values were increased for the annealed thin films, the lattice parameter increases with an increase in carrier concentration, the change being as high as 0.78%. The carrier concentration and mobility in these films are in the range 1018 to 1020 cm<sup>-1</sup> and 4 to 80 cm<sup>2</sup> V<sup>-1</sup> S<sup>-1</sup> respectively. The carrier concentration in annealed single-phase at 200° C film is high (> 1020 cm<sup>-3</sup>). The effective mass of electrons near the bottom of conduction band has been estimated to be about 0.16 and is found to increase at higher carrier concentrations. The absorption edge occurs in the visible region, as the carrier concentration is high, plasma resonance occurs in the infrared region. Due to annealing for one different temperature of 200° C the absorption edge shifts from 2.3 to 2.7 eV, with increasing carrier concentration.

**Keywords:** Jet Nebuliser technique, CdSnO<sub>4</sub>, band gap and carrier concentration

**EFFECT OF GAMMA RADIATION ON THE OPTICAL PROPERTIES OF INTERMOLECULAR HYDROGEN BONDED LIQUID CRYSTAL COMPLEX**

Sundaram S<sup>a</sup>, Jayaprakasam R<sup>b</sup>, Senthil T S<sup>c</sup>, Vijayakumar V N<sup>d</sup>,

\*a Department of Science and Humanities, Christ the King Engineering College, Coimbatore, Tamil Nadu, India  
b Department of Chemistry, Bannari Amman Institute of Technology, Sathyamangalam-638 401, Tamil Nadu, India  
c Department of Physics, Erode Sengunthar Engineering College, Perundurai- 638 057, Tamil Nadu, India  
Department of Physics, Bannari Amman Institute of Technology, Sathyamangalam-638 401, Tamil Nadu, India  
\*Email: vnvphysics@gmail.com

#### Abstract

The present study investigates the role of gamma irradiation in altering the mesogenic nature, thermal and optical properties of multiple hydrogen bonded liquid crystal (HBLC) complex. A hydrogen bonded liquid crystal complex is derived from citric acid (CA) and 4-dodecyloxybenzoic acid (12OBA) in three different ratios and irradiated by gamma-rays with the doses of 25kGy and 50kGy. The structural, optical and thermodynamic parameters of these gamma irradiated complex was investigated by Fourier transform infrared (FT-IR), polarizing optical microscopy (POM), differential scanning calorimetry (DSC) techniques. While the HBLC complex exhibits nematic and smectic X phases, the gamma irradiated CA+11OBA HBLC complex reveal a rich phase of polymorphism due to ionization and induced  $n-\pi^*$  transitions with smectic C (Sm C) and smectic F (Sm F) phases. Due to the influence of gamma irradiation on HBLC, a higher order stabilized smectic phases and enhanced phase width (Sm C and Sm F) have been identified. This may be an opt material for photonic devices.

**Keywords:** HBLC complex, Nematic, smectic C, POM, gamma irradiation

### PREPARATION AND CHARACTERIZATION OF CARBON NANOSTRUCTURES SYNTHESIZED BY USING LECHLANCHE CELL BATTERY CHEMICAL WASTE

S. Gnanasaravanan, B.Nivetha, A. Ayeshamariam\*, Shaik Abdul Khadir, M. Jayachandran,  
Bharathidasan University, Tiruchirappalli – 620 024, India.

Department of Physics, Khadir Mohideen College, Adirampattinam - 614701, India.  
Department of Computer Science, Khadir Mohideen College, Adirampattinam - 614701, India.  
Department of Physics, Sethu Institute of Technology, Pullor, Kariyapatti, Tamil Nadu.

\*Email: aamariam786@gmail.com

#### Abstract

Lechlanche Cell battery waste was synthesized by using biosynthesis boiling method. Tamarind essence as 10 ml was used as reducing agent with 1Molar mother solution to try to get the carbon nanostructures and succeeded. The prepared nano powdered particles were well matched with the JCPDS file No-89-8492. A suitable inexpensive green synthesis method was adopted to derive Diamond carbon nanostructure of synthesized nanoparticles and characterized to study its electronic properties. The structural and morphological studies were adopted by the help of SEM, EDAX analysis, XRD and GCMS. Application of the derived Carbon nanostructure may be useful to improve the sensitivity of gas sensor towards toxic gases is to be studied. Implementation of the idea towards the hardware designing of a suitable electronic device based on Carbon nanostructures will be studied.

**Keywords;** GCMS, FTIR, EDAX and GCMS

### SPECTROPHOTOMETRIC DETERMINATION OF NITRATE ION IN THE PRESENCE OF CHLORIDE ION

Rajalakshmi.P\*, Radhika.V\*\*

Department of Chemistry, P.K.R. Arts College for Women, Gobichetipalayam.  
Department of Physics, P.K.R. Arts College for Women, Gobichetipalayam.

\*Email: rajalakshmimsc09@gmail.com Mobile:8012286046

#### Abstract

<sup>89</sup>Sr a radionuclide used for bone pain palliation - is produced in Fast Breeder Test Reactor (FBTR) via the <sup>89</sup>Y (n, p) <sup>89</sup>Sr reaction. The final <sup>89</sup>Sr source is obtained after processing the irradiated Y<sub>2</sub>O<sub>3</sub> target using nitric acid. The final product <sup>89</sup>Sr is injected in HCl medium whose concentration must be 0.05 - 0.5M. The final product which was obtained after the chemical processing in the nitric acid is converted into its chloride form. The estimation of nitrate ion in the source is an indication of i) the efficiency of the conversion and ii) the source is free from the nitrate ion impurity. Hence it is necessary to determine the presence of nitrate in the product. So a method was developed in the laboratory to estimate the nitrate ion concentration in presence of bulk chloride ion concentration by spectrophotometric method.

**Keywords:** radionuclide, estimation, nitrate ion, spectrophotometric method

### DESIGN OF BIO-NANOBOTS USING FUZZY MACHINE LEARNER WITH COLLABORATION OF NANO AND DATA MINING TECHNOLOGIES IN THE TREATMENT OF BREAST CANCER

R.Vidya, Vigneshwara Raj. D

Department of Computer Science, St.Joseph College of Arts and Science(Autonomous), Cuddalore.  
Department of BBA (Computer Applications), St.Joseph College of Arts and Science(Autonomous), Cuddalore.

#### Abstract

Breast Cancer is one among the dreadful cancer that persuades speed intensifying tumour in short period of time. This cancer very common in women lacks support from them due to family reasons and non-willingness to express and cure it in time. The objective of the study is to design a bio-nanobot capable of preventing, destroying early tumours in case of benign tumours and also indicate the location of tumour in case of advanced malignant stage. The nanobot is a mobile sensor device with size in the range of 0.1 to 10 micrometres that could be easily injected as solution into the blood stream to detect cancer in the breast region of the women. The movement of the bio-nanobots are controlled by external sensors operated by mobile devices. The nanobots are programmed to detect the cancer cells in two stages benign for early stage and malignant for advanced stage respectively. To demonstrate the bio-nanobot framework, Wisconsin Diagnostic Breast Cancer (WDBC) is collected from secondary sources with predictive feature diagnosis using values M for Malignant and B for Benign respectively. The Predictive feature is supported with the dimensions of the cancer cells in breast region where measurements are allocated using fuzzy based clustering with different combined classification sets. The nanobots will be designed with a macro program to detect fuzzy sets and will be injected into the blood stream of the patient. The nanobots movement reaches the tumor cells and identifies the cancer and non-cancer cells using the attributes like radius, texture value, perimeter, area and smoothness of the cells in the target location. The concavity and concave points are accepted as identifiers of the tumours with automatic calculation of compactness which indicates the level of cancer in the cell. The nanobots uses the sensors to indicate the location if the cells are malignant whereas it can destroy the tumour if it is in early stage using Nano laser molecules. The Fuzzy based machine learning algorithm is created using MATLAB modelling with the collected breast cancer dataset features. The research would provide insights into the new dimension of medical treatment for cancerous patients in the future.

**Keywords:** bio-nanobots, fuzzy machine learner, Wisconsin Diagnostic Breast Cancer, benign tumour, malignant tumour, breast cancer prediction.

### PREPARATION OF NANOCRYSTALLINE $Y_2O_3$ PRECURSOR MATERIAL

Rajalakshmi P

#### Abstract

$^{89}Sr$  a radionuclide used for bone pain palliation - is produced in fast reactors via the  $^{89}Y(n, p)^{89}Sr$  reaction. An irradiation for the production of  $^{89}Sr$  in FBTR is done recently. The chemical processing in the lab scale is also completed. The most suitable dissolution step i.e. Reflux method took approx. 40 hours in conc.  $HNO_3$ . To reduce the processing time it was decided to use nanocrystalline  $Y_2O_3$  owing to its high surface area to result faster dissolution. Nanocrystalline  $Y_2O_3$  was prepared from commercially available micro  $Y_2O_3$  by dissolution in  $HNO_3$ , followed by precipitation with ammonium hydroxide.

### GROWTH AND CHARACTERISATION OF SN DOPED WITH $TiO_2$ THIN FILM PREPARED BY USING JET NEBULISER TECHNIQUE

K. Nithya, M. Kavin Micheal, R.Senthil, A. Afroos Banu, A.Ayeshamariam  
Bharathidasan University, Thiruchirappalli, 620 025, India

Department of Physics, Khadir Mohideen College, Adirampattinam. 614701, India  
Email; aamariam786@gmail.com

#### Abstract

The purpose of the present work is focused on novel contributions to Jet Nebuliser technique, concerning the enhancement of deposition rate, crystallinity and homogeneity of as-prepared Sn doped  $TiO_2$  thin films. High transparency, combined with useful electrical conductivity is achieved by selecting a wide-band gap oxide, of Sn doped  $TiO_2$  thin films by this technique and characterized for photovoltaic applications. The deposited thinfilm was annealed at  $200^\circ C$  and measured the thickness was  $45\ \mu m$  and crystallite size was nearly  $58\ nm$  for RT thin film and annealed thin film thickness was  $47\ \mu m$  and crystallite size was nearly  $62\ nm$ . The different deposition parameters such as substrate temperature and substrate to target distance are fixed. The deposited Sn- $TiO_2$  thin films were characterized by XRD, XPS, UV-VIS Spectrum, AFM, SEM, EDAX and Mott-Schottky studies. **Keywords:** Sn-  $TiO_2$ , XRD, thinfilm and Mott-Schottky studies.

### SYNTHESIS, SPECTROSCOPIC INVESTIGATION AND DFT STUDIES ON 2,5-BIS (4-HYDROXY-3-METHOXYBENZYLIDENE)- CYCLOPENTANONE

G. MANIKANDAN\*, V. THANIKACHALAM

Department of Chemistry, Thiru Kolanjiappur Government Arts College, Virudhachalam 606 001.  
Department of Chemistry, Annamalai University, Annamalainagar 608 002.

#### Abstract

The optimized molecular structure, vibrational frequencies, corresponding vibrational assignments of 2,5-bis (4-hydroxy- 3-methoxybenzylidene) cyclopentanone (BHMBC) have been investigated by using density functional theory (B3LYP) methods at 6-311G(d,p) basis set. The energy and oscillator strength calculated by Time Dependent Density Functional Theory (TD-DFT) results almost compliments with experimental findings. Then, gauge-including atomic orbital (GIAO)  $^{13}C$  NMR and  $^1H$  NMR chemical shifts calculations of the BHMBC molecule were carried out by using B3LYP functional with 6-311G(d,p) basis sets. The mass spectrum is also recorded. Moreover, we have not only simulated highest occupied molecular orbital (HOMO) and lowest unoccupied molecular orbital (LUMO) but also determined the transition state and energy band gap. The stability of the molecule arising from hyperconjugative interaction and charge delocalization has been analyzed using natural bond orbital (NBO) analysis. Besides, molecular electrostatic potential (MEP) were performed by the DFT method and the infrared and Raman intensities have also been reported.

**Keywords:** DFT, HOMO, LUMO, Curcumin, NBO, MEP

## **RADIOACTIVE CHARACTERIZATION OF M – SAND AROUND CAUVERY RIVER BELT, TAMILNADU**

S. Gnanasaravanan , P. Rajkumar

Department of Physics, Khadir Mohideen Colege, Adirampattinam, Thanjavur – 614701. Tamilnadu, India.

Department of Physics, A.A. Government Arts College, Musiri, Tiruchirappalli - 621201, Tamilnadu, India.

Email: rajkumarrspm@gmail.com, Tel: +91 9790338221

### **Abstract**

Radioactivity is a naturally occurring process and it emits radiations. Most of the radio activities are dangerous to living organisms especially to the human beings. As human beings, we should be aware of these radio activities. Mostly the emission of radiation is due to the presence of radio nuclei. These radiations lead to hazardous backlashes to the living being. The study about the distribution of the radioactivity presence in natural and artificial materials enables one to assess any possible radiological hazard to humankind by the use of such materials. The major aim of this work is to study the natural radioactive range manufactured sand (M-Sand) samples around Cauvery River belt, Tamilnadu, India. The radioactive characterizations of the samples have been measured using gamma ray spectrometer. The activity concentrations of the studied samples are within the world and Indian average values.

## **NATURAL RADIOACTIVITY AND MINERALOGICAL CHARACTERIZATION ON RIVER SAND AND MANUFACTURED SAND IN CAUVERY RIVER BELT, TAMILNADU, INDIA**

S. Gnanasaravanan , V.Senthilkumar

Department of Physics, Khadir Mohideen Colege, Adirampattinam, Thanjavur – 614701. Tamilnadu, India.

Department of Physics, Chikkanna Government Arts College, Tamilnadu, India.

Email: sg.saravanan80@gmail.com. Tel: +91 9865277728

### **Abstract**

Monitoring of building materials are most important, because, long-term exposure of radioactivity through inhalation leads to severe health hazards and extended up to tumors. Characterization of sand provides important information such as shape, strength and so on. Proper choice of aggregates has significant influence on the fresh and hardened properties of concretes in building constructions. The major objective of this work is to measure the natural radioactive level and mineral characteristics of the River Sand (R-Sand) samples from Cauvery river belt and manufactured sand (M-Sand) samples around Cauvery River belt, Tamilnadu, India. The mineralogical characterizations of the samples have been studied using Fourier Transform Infra Red (FTIR) Spectroscopic technique. The radioactive characterizations of the samples have been studied using gamma ray spectrometer. All the obtained results are discussed and it is found that M – sand has more benefit than the R – sand in all aspects of radiological and mineralogical characterization.

## **SURVEY ON NANO TECHNOLOGY**

D.Seethalakshmi, G.M. Nasira

Research and Development Centre, Bharathiar University, Coimbatore, Tamilnadu, India.

Department of Computer Application, Chikkanna Government Arts College, Tirupur, Tamilnadu, India

### **Abstract**

Nano technology is a science diversified field which deals with various subjects. It manipulates the matter at atomic and molecular level which is used to fabricate the products at the scale ranges from 1 to 100 Nanometer. There are lots of developed and growing applications in the field of Nano. The research is going on precisely one of the latest application Nano engineered bio ink. It's a 3D printing technology doing by Nanowerk spot light. This is fast growing medical application which helps to treat the patients. In the current scenario the major issues faced at 3 dimensional bio printing is bio inks – a jelly like substance which contains majority of water which is not able to print near the other 3D printed material because it is not enough strong at bio cell friendly concentrations and cannot do 3D print self-sustaining anatomic size structured live cells. The current bio inks used for 3D printing technology are not satisfies the requirement because of usage of polymer solutions. To overcome this challenges, the highly printable bio ink used for fabricating. Through strengthening the bio ink which combines Nano composite reinforcement with Ionic Covalent Entanglement (ICE) used to create an active Nano Engineered Ionic-Covalent Entanglement (NICE) bio ink with excellent printability.

**Keywords:** Nanowerk, bio ink, Ionic Covalent Entanglement

## A CRITICAL REVIEW OF ECONOPHYSICS AND QUANTUM-LIKE APPROACHES IN FINANCIAL MARKET DYNAMICS MODELLING

Vinod K., Nasira G.M, Haresh M Pandya

Department of Computer Applications, Chikkanna Government Arts College, Tirupur.

Department of Physics, Chikkanna Government Arts College, Tirupur.

\*Email: krishnanvinod@yahoo.com

### Abstract

Adaptive behavior to changing environment are characteristic of both physics and economics systems. Use of techniques from quantum mechanics and statistical physics to quantify market volatility may provide an alternative interpretation to the cognitive processes involved in investor decision making. The approach enables the interpretation of information processing at a cognitive level through consideration of quantum effects in the price formation. A quantum like framework allows to ascertain the influence of soft market determinants like change in investor behavior and expectations on the aggregated dynamics of financial system.

## PREPARATION AND CHARACTERIZATION OF ELECTRODESPOSITED Ni-SiC COMPOSITE FILMS

K.Karthick\*, G.Kanchana

Department of Physics, Government Arts College (Autonomous), Coimbatore

### Abstract

Composite coatings are popular compared to metallic coatings, due to their excellent tribological properties and enhanced corrosion resistance [1]. Such incorporated particles improve the overall properties of the coating such as adhesion, anti-friction, microhardness and the mechanical strength [2]. Ni-SiC composite coatings are prepared by Watts bath in the electrodeposition method for different volume fraction of SiC. The various parameters such as temperature, time and current density are optimized. XRD studies reveal that the grain size decrease with increasing content of SiC. Surface morphology of the films are studied using FESEM. EDAX results confirm the presence of Ni and SiC in the films. The hardness of the films is found to increase with SiC content analysed by Vicker's microhardness. Corrosion studies are carried out by weight loss method.

### References:

1. Meenu Srivastava, V.K. Willam Grips and K.S. Rajam, Materials Letters 62 (2008) 3487- 3489.
2. Kailash Hamal, Armila Rajbhandari, Gobinda Gyawali and Soo Wahn Lee, Jorhat Institute of Science Technology 21 (2016) 82-85.

## A SURVEY ON VOICE DISORDER FOR IDENTIFYING VOICE PATHOLOGY

P.Kokila, G.M.Nasira

Department Of Computer Applications Chikkanna Govt Arts college Tirupur-02

### Abstract

Now a days, Identification and Classification of voice pathology plays a major role in the field of speech processing. This paper explores and compares various things like input database, parameters, features extraction techniques, methodology and classification techniques used by the researchers in the problem of identifying the voice pathology. In this paper, we compared seven research works done in the field of voice pathology identification and classification. By analyzing the data's mentioned in these research papers and by considering these research papers as a base study, we wish to do the further research on voice pathology identification.

**Keywords:** Voice Pathology, Classification, Acoustic Analysis, Vocal Fold, MDVP Parameters.

## FOCUSING PROPERTIES OF HYBRIDLY POLARIZED DOUGHNUT GAUSSIAN BEAM THROUGH A DIELECTRIC INTERFACE

C. Kavitha , M.Lavanya, M. Udhayakumar, K.B.Rajesh\*

Department of Physics, PSGR Krishnammal College for Women, Coimbatore, Tamilnadu, India.

\*Department of Physics, Chikkanna Government Arts College, Tirupur, Tamilnadu, India

\* Email: rajeskb@gmail.com

### Abstract

The tight focusing properties of hybridly polarized doughnut Gaussian beam through a dielectric interface are investigated numerically by vector diffraction theory. The depth of focus and FWHM are calculated for the different parameters of hybridly polarised doughnut Gaussian beam. It is observed that by increasing the value of  $n$  for  $-0.2$  and  $0 = 0.125$  the focal depth improved to  $74.2$ . Increasing  $n[0]=0.9$  and  $-0 = 0.8$ , the focal depth is found to be  $39.7$  and FWHM of  $0.51$ . For  $0 = 0.500$ ,  $-0 = 0.8$  and  $n[0] = 0.5$  the depth of focus is  $20$  and FWHM is  $0.6$ . It is observed that hybridly polarized doughnut Gaussian beam generates a strong transversely polarized optical needle with long depth of focus and minimum spot size. The strongly transversely optical needle holds great potential in ultra high density magnetic recording, atomic traps and optical switches.

**Keywords:** Focusing properties, doughnut beam, dielectric interface, vector diffraction theory

## STRUCTURAL, ELECTRICAL AND OPTICAL STUDIES ON SPRAY-DEPOSITED ALUMINIUM-DOPED ZnO THIN FILMS

M.Raja, V.SenthilKumar\*,  
Department of Physics, Chikkanna Government Arts College, Tiruppur, Tamilnadu

#### Abstract

Thin films of zinc oxide (ZnO) were deposited on cleaned glass substrates spray coating technique using as precursor solution. Also, aluminium-doped thin films of ZnO were prepared by using  $\text{AlCl}_3$  as doping solution for aluminium. The dopant concentration was varied from 0 to 1.5 at% in thin films of ZnO prepared in different depositions. Structural characterization of the deposited films was performed with-ray diffraction (XRD) studies. It confirmed that all the films were of zinc oxide having poly-crystalline nature and possessing typical hexagonal quartzite structure with crystallite size. The films exhibited changes in relative intensities and crystallite size with changes in the doping concentration of Al. The electrical studies established that 1 at% of Al-doping was the optimum for enhancing electrical conduction in ZnO thin films and beyond that the distortion caused in the lattice lowered the conductivity. The films also exhibited distinct changes in their optical properties at different doping concentrations.

**Keywords:** spray method, ZnO: Al, Thin films, SEM, XRD,

### CREATION OF MULTIPLE FOCAL SPOTS USING PHASE MODULATED RADIALLY POLARIZED DOUGHNUT GAUSSIAN BEAM WITH BINARY PHASE FILTER

T.Karthika, K. Prabakaran\*, K.B. Rajesh  
Department of Physics, Mahendra Arts and Science College (Autonomous), Namakkal, Tamilnadu, India  
Department of Physics, Chikkanna Government Arts College, Tiruppur, Tamilnadu, India  
Email:prabakaran27mar@gmail.com

#### Abstract

The generation of multiple focal spot segments using phase modulated radially polarized doughnut Gaussian beam with binary phase plate is investigated theoretically by vector diffraction theory. In our knowledge, the focusing properties of the radially polarized DGB with binary phase wave front are not studied. The present paper is aimed at studying high refractive index particles trapping by using phase modulate radially polarized doughnut gaussian beam. The possible design of binary phase filter to achieve multiple focal spots segments which finds wide applications in multiple optical trapping, micromanipulation, optical manipulation of high refractive index particles.

### CREATION OF AN ULTRA-LONG MAGNETIZATION NEEDLE GENERATED BY SUPER-RESOLUTION LONGITUDINALLY POLARIZED BEAM WITH A TERNARY OPTICAL ELEMENT

M.Udhayakumar, K.Prabakaran, K.B. Rajesh\*  
\*Department of Physics, Chikkanna Government Arts College, Tiruppur, Tamilnadu, India  
Department of Physics, Mahendra Arts and Science College (Autonomous), Namakkal, Tamilnadu, India  
\* Email:rajeskb@gmail.com

#### Abstract

Based on the vector diffraction theory and Inverse Faraday Effect, a super-long longitudinal magnetization needle with ultra-long depth of focus (DOF) is generated by tightly focusing a azimuthally polarized beam that is modulated by a self-designed ternary hybrid (phase/amplitude) filter (THF). Both the phase and the amplitude patterns of THF are judiciously optimized by the versatile particle swarm optimization (PSO) searching algorithm. For the focusing configuration with a combination of a high numerical aperture (NA) and the optimized sine-shaped THFs, compare with parameter optimizing to produce an ultra-long magnetization needle with lateral sub-wavelength scale and a super-long spherical magnetization chain with three-dimensional super resolution. The present work regarding these super-resolution magnetization patterns is of great value in high density all-optical magnetic recording, atomic trapping as well as confocal and magnetic resonance microscopy.

**Keywords:** Super-Resolution, Diffractive Optical Element, azimuthally polarized beam.

### GROWTH AND CHARACTERIZATION OF EFFECT OF DYE ON THIOUREA NANO CRYSTALS FOR LASER APPLICATIONS

S.PANIMALAR , C.TAMILMALAR , P.KUMARESAN  
Thiru A.Govindasamy Govt. Arts College, Tindivanam. Email: panimalar31185@gmail.com

#### Abstract

Crystal growth and characterization is of vital interest to many scientists in industry and in universities. Crystals of all kinds are required for scientific studies and new applications. The literature of crystal growth is expanding faster than almost any comparable field of science. The single nano crystal of Thiourea doped RhodamineB was grown by slow evaporation and also slow cooling solution technique (0.5degree C/Day).The UV-VIS-NIR spectrometer in the range of 200nm-1200nm.The optical band gap of grown nano crystals was found to be 3.87eV.The Linear optical constants such as reflection, refractive index and extinction co-efficient were also estimated. This results of optical studies suggest that 2mole%.Thiourea doped RhodamineB nano crystal possesses slightly improved transparency than pure Thiourea. The pure and doped Thiourea nano crystals are transparent in the entire visible region and have minimum absorbtion. The TGA and DTG studies shows that thiourea nano crystals not altered the thermal stability. Hardness studies shows that Thiourea crystals are in soft material. The presence of dopant has improved the NLO properties of the gram crystals and these nano crystals can be promising material for nonlinear device fabrication.

**PHOTO CATALYTIC DECOMPOSITION OF PESTICIDE DICHLORVOS USING NANO CATALYSTS VIA GREENER ROUTE.**

A. Franklin Ebenazer, P. Vijayan, N. Sampathkumar and M. Sivadhayanidhya\*  
 Department of Chemistry, Chickanna Government Arts College, Tirupur, Tamilnadu, India  
 E.Mail :franklinebenazer@yahoo.com

**Abstract**

In the present study, was degraded with Photocatalytic active p-type semiconductor and p semiconductors. The Nano  $\text{WO}_3$  was synthesized from Sodium Tungstate by novel route and nano  $\text{TiO}_2$  was synthesized through sol-gel technique from titanium (IV) isopropoxide by hydrothermal treatment. The synthesized materials were characterized by different techniques such as XRD, UV, FTIR, SEM and TEM. In order to find out their photocatalytic ability and degradation of Dichlorvos, experiment was carried out in aqueous suspension under UV light. The reaction pathway and mechanism were studied. From the evaluation, Nano  $\text{TiO}_2$  showed higher active when compare with other catalyst.

**Keywords:** Photocatalyst, Dichlorvos, Nano  $\text{TiO}_2$ , Decomposition.

**CREATION OF MULTIPLE FOCAL HOLES SEGMENTS USING PHASE MODULATED AZIMUTHALLY POLARIZED DOUGHNUT GAUSSIAN BEAM WITH BINARY PHASE FILTER**

V.Karthik, K. Prabakaran\*, K.B. Rajesh,  
 Department of Physics, Mahendra Arts and Science College (Autonomous), Namakkal, Tamilnadu, India  
 Department of Physics, Chikkanna Government Arts College, Trippur, Tamilnadu, India  
 Email:prabakaran27mar@gmail.com

**Abstract**

Based on the vector diffraction theory, the effect of binary phase filter on the intensity distribution of azimuthally polarized doughnut Gaussian beam in the focal region of high NA lens is investigated theoretically. It is observed that a properly designed multi belt binary phase filter can generate a subwavelength novel focal patterns including splitting of focal spots and generation of multiple focal hole segments such as four, three and two focal holes along optical axis are obtained. The author expects such investigation is useful for optical manipulation and material processing, multiple low refractive index particle trapping technologies.

**FOCAL SPLIT WITH TUNABLE FOCAL SHIFT OF CIRCULARLY POLARIZED ASYMMETRIC BESSEL MODULATED GAUSSIAN BEAM THROUGH A UNIAXIAL BIREFRINGENT CRYSTAL**

D.Thiruarul, M.Mayilsamy, K.B.Rajesh\*, Haresh.M.Pandya\*  
 \*Department of Physics, Chikkanna Government Arts College, Tiruppur, Tamilnadu, India  
 \*Email: rajeshkbb@gmail.com

**Abstract**

Focusing properties such as focal split with tunable focal shift of circularly polarized asymmetric bessel modulated Gaussian beam tightly focusing through a uniaxial birefringent crystal is studied numerically by the use of vector diffraction theory for small birefringent. From the numerical results we also noted that the intensity distribution of focal structure in the focal region can be shift along the longitudinal axis. We also noted that a single spot can axially be splitted into multiple spots with the increasing of birefringence value  $[\Delta n]$ . And for specific real value of beam parameter  $\mu$ . It is also observed that the imaginary value of  $\mu$  alters axial intensity distributions. Such that resultant focal structure is an optical cage of sub wavelength scale. Such a tunable focal patterns are useful for applications such as optical trapping, shifting and manipulation of microscopic object.

**Keywords:** Uniaxial crystal, circularly polarized beam, High NA lens.

**PREPARATION AND CHARACTERIZATION OF  $\text{MoO}_3$  THIN FILMS BY SPRAY PYROLYSIS TECHNIQUE**

S.Sathish Kumar, G.Umadevi  
 Department of Physics Government Arts college, Coimbatore.

**Abstract**

$\text{MoO}_3$  thin films were deposited on quartz substrates using the spray pyrolysis technique. First different concentrations of Ammonium molybdate hepta tetrahydrate  $(\text{NH}_4)_6\text{Mo}_7\text{O}_{24} \cdot 4\text{H}_2\text{O}$  as 0.025M, 0.05M, 0.075M and 0.1M were taken as precursors. The precursors were dissolved in 25ml distilled water. The solution was homogenously stirred for half an hour. To pulverize solution, air was injected at the constant pressure of  $2.2\text{Kg}/\text{cm}^2$ . The substrate was kept at constant temperature of  $4000^\circ\text{C}$ . The solution was filled in the nozzle and the nozzle to substrate plane distance was fixed at the optimal value of 13cm also the horizontal sweep of the nozzle had been optimized to ensure the uniformity of deposited thin films. The precursors flow rate was constant and deposition time fixed at 20 seconds. After deposition, the coated substrates were allowed to cool down naturally to room temperature. The XRD studies confirmed that the coated film had an orthorhombic ( $\alpha$ ) $\text{MoO}_3$  structure and the crystallites were at higher orientation in the planes of (040) and (060) and the surface morphology studies revealed by the FESEM showed nanorods and nanoplate structures for 0.05M and 0.075M. Due to higher surface to volume ratio of these nanoplates, they could be used as Sensors.

**Keywords:**  $\text{MoO}_3$ , concentrations, spray pyrolysis, nanoplates

**PROTON TRANSPORT IN GRAPHENE SHOWS PROMISE FOR RENEWABLE ENERGY**

Subramanian S, K.B.Rajesh, R.Sakthi sundar saravanan  
 Department of physics, Chikkana Government college, India  
 Email: sivas2175@gmail.com / Mobile: 8072760175

**Abstract**

Photo detectors have been widely used for sensors as they have efficiency for detecting light (or) electromagnetic radiation. Photo detectors now a days use photo-electron transport which is a result of detecting light. Most of the commercial photo detectors use silicon as a semiconductor material. Graphene, on the other hand which is a result of photo-proton transport seem to have higher efficiency than commercial photodiodes. Such devices which use graphene as a membrane for proton transport resulting in high responsivity not only detect light but also produce hydrogen gas (A promising green fuel) which can be widely used for fuel cells and other applications.

**Keywords:** Photo detectors, Graphene, Proton transport, Hydrogen gas

**DENSITY FUNCTIONAL THEORY APPROACH ON DYE DOPED KDP CRYSTALS FOR NON LINEAR OPTICAL APPLICATIONS**

S. Rajeshkumar & P. Kumaresan

P.G Department of physics, King Nandhivarnan College of Arts and Science, Thellur-604406, Tamil Nadu, India  
 P.G & Research Department of Physics, Thiru. A. Govindasamy Government Arts College, Tindivanam - 604 002, Tamil Nadu, India. Email : srk.ss82@gmail.com

**Abstract**

Potassium Dihydrogen Phosphate (KDP) doped with dyes and it has been grown by slow solvent evaporation method at room temperature. The properties of the crystal have been improved by doping of organic impurities. In the present investigation, Pure and dye (Magneson I) doped KDP crystals are verified by Powder X-ray diffraction studies for phase analysis and structure determination. The presence of the functional groups has been identified by Fourier Transform Infrared spectrum (FTIR). The infrared absorption bands were identifying the molecular components and structures. The optical nature of the grown crystal is analyzed by using the UV-Visible spectrum. The UV-Visible spectrophotometer is used to determine the absorption or transmission of light by a sample.

**Keywords:** Crystal growth; KDP crystal; DFT Studies

**SYNTHESIS OF ZNS NANOPARTICLES BY CHEMICAL PRECIPITATION METHOD**

C.Selvanayagi, S.Sasikala

Department of physics, Navarasam arts and science college for women, Erode.  
 Email: sasiphysics86@gmail.com

**Abstract**

A nanoparticle is a microscopic particle with at least one dimension less than 100nm. Zinc sulphate is an inorganic compound and dietary supplement. It is used to treat zinc deficiency and to prevent the condition in those at high risk. Among chemical route, chemical precipitation method is a simple technique which is given more priority due to its low cost, few remains after calcinations and easy industrialization. In the present study zinc sulphate nanoparticles were successfully synthesized by using chemical precipitation method. The synthesized nanoparticles characterized using XRD, SEM, EDAX, and PL. The results are well matched with standard values.

**Keywords:** Zinc sulphate, chemical precipitation, PL.

**Reference:**

- 1) U.S .Senapati, D.K .Jha, D.Sarkar, Res.J.of Phy .Sciences, 1(7), 1 ,(2013)

**INVESTIGATIONS ON BINARY MIXTURES FORMED BETWEEN METHYL MALONIC ACID AND BENZOIC ACIDS**

S.Kavithaa, G. Chandrasekara, N. Pongali Sathya prabu

Department of Physics, Gobi Arts & Science College, Gobichettipalayam  
 Bannari Amman Institute of Technology, Sathyamangalam

**Abstract**

Liquid crystalline mesogens formed between Methyl malonic acid (MM) and p-n-alkyloxy benzoic acids (nBAO, n = 5 to 12) exhibit rich phase polymorphism. Eagerness in investigating the mesogenic thermal range of individual mesophases and to analyze the optical and thermal properties exhibited by them lead to the preparation of different binary mixtures between the above said mesogenic complexes. MM+7BAO and MM+10BAO are chosen to prepare the binary mixtures as they possess rich mesogenic properties. Five such binary mixtures are prepared by varying the molar ratio in steps of 0.1 to 0.5. Nematic phase are observed in four binary mixtures and Smectic B phase is obtained only one binary mixture. Polarizing Optical Microscope (POM) is utilized to identify the textures of the mesophases and the transition temperatures. To evaluate the enthalpy value and the order of mesophase transition, thermograms obtained from Differential Scanning Calorimetry (DSC) are examined. Phase diagram of the binary mixtures obtained is constructed from the POM and DSC data.

**Keywords:** Phase polymorphism, binary mixture, optical properties and thermal properties.

## A REVIEW OF NANO STRUCTURED AL DOPED ZNO THIN FILMS PREPARED BY CHEMICAL BATH DEPOSITION METHOD

U. Jaya Priya, V. Senthil kumar\*,

Department of Physics, Chikkanna Government Arts College, Tiruppur, Tamilnadu, India.

\*Email: kalasen2009@gmail.com

### Abstract

Zinc oxide (ZnO) is a unique material that exhibits both semiconducting and piezoelectric properties. It has wide band gap which directly provides huge potential for electronic, opto-electronic and optical applications. Its thin film also serves an important role in sensing mechanisms on suitable substrate in various sensors. Of the various methods available, Chemical Bath Deposition (CBD) method is the one that is used prominently for film deposition mainly for its simplicity and affordability. The present paper critically provides a review Al doped ZnO thin films deposited with different concentration of dopants from 2014-2017. The experimental studies and the results obtained are reviewed.

**Keyword:** Zinc oxide thin film, Aluminium, chemical bath deposition, applications.

## BINARY MIXTURES OF DOUBLE HYDROGEN BONDED LIQUID CRYSTALS

R. Malathi, G. Chandrasekara, N. Pongali Sathya Prabu

Department of Physics, Gobi Arts & Science College, Gobichettipalayam

Bannari Amman Institute of Technology, Sathyamangalam

### Abstract

Thermotropic double hydrogen bonded liquid crystals comprising of Methyl Malonic acid (MM) and p-n-alkyloxy benzoic acids (nBAO, n=7 and 12) have been prepared and investigated in the present study. It comprises of nematic, smectic C and smectic G mesogenic phases. Complexes consisting of smectic B phase swap away smectic C phase and absence of smectic G phase have been chosen for the preparation of binary mixtures whose molar ratio varies from 0.1 to 0.5. The optical and thermal properties of the prepared binary mixtures have been investigated. Five binary mixtures are formed as a result of different molar proportions between the chemical components. These binary mixtures are further characterized by Fourier Transform Infra-red spectroscopy (FTIR) for confirmation of hydrogen bond existence. Polarizing Optical Microscope (POM) and Differential Scanning Calorimetric (DSC) thermograms are recorded for textural observation and individual phase transition temperature correlation for individual mesogenic phases respectively. Phase diagrams have been constructed from the POM and DSC data. Thermal studies such as specific heat analysis, thermal stability factor, odd-even effect, order of phase transition are extracted from the DSC thermogram data.

**Keywords:** Binary mixtures, Odd even effect, Cox ratio, Specific heat.

## SYNTHESIS AND CHARACTERIZATION OF TERNARY ALLOYED $\text{Cu}_{0.5}\text{Mn}_{0.5}\text{S}$ THIN FILM

R. Priyadharshini\* and R. Sakthi Sudar Saravanan

Department of Physics, Chikkanna Government Arts College, Tiruppur – 641602, Tamilnadu, India

\*E. Mail: priyadharshinisakthi96@gmail.com, Mobile: +91 8489084247

### Abstract

Ternary alloyed  $\text{Cu}_{0.5}\text{Mn}_{0.5}\text{S}$  thin films were prepared by chemical bath deposition (CBD) on glass substrates at 70 °C temperature from an aqueous alkaline medium using a precursor solution containing copper acetate, manganese acetate, thiourea and trisodium citrate. The pH of bath was kept constant around 10. The structural and surface morphological properties of the prepared film have been studied by X-ray diffraction (XRD) and Scanning electron microscopy (SEM) techniques. Energy dispersive analysis of X-rays confirmed that the films are nearly stoichiometric in composition. X-ray peak broadening was used to evaluate the crystallite size by the Scherrer method. The optical transmission spectra are recorded within the range of 200–900 nm.

**Keywords:** Thin film; CBD; Ternary alloy;  $\text{Cu}_{0.5}\text{Mn}_{0.5}\text{S}$ ; XRD; SEM

## SYNTHESIS AND CHARACTERISATION OF COPPER OXIDE NANO PARTICLES USING MURRAYA KOENIGII AND INVITRO ANALYSIS

P.Jothi ragavi , K.Surya

Department of physics, Navarasam arts and science collage for women, Erode

Email: suryaaprabhu26@gmail.com,

### Abstract

The Green synthesis of metal nanoparticles is an essential field in nanotechnology and Nanoscience. In this present work synthesis of CuNPs was carried out by using leaf extract of *Murraya Koenigii* and Copper Sulphate ( $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ ) solution. In the present work, the capping material is leaf extract, it work as reducing agent. The formation of copper oxide nanoparticle has been characterized by X-Ray Diffraction (XRD). The qualitative and quantitative component of the CuNPs analyzed using Energy Dispersive X-Ray Microscopy (EDS) and further invitro analysis was performed using gram positive *staphylococcus aureus* and gram negative *Escherichia coli*. The functional groups of the CuNPs are investigated through Fourier Transform Infrared Spectroscopy (FTIR). The surface morphological structure of copper oxide nanoparticle where obtained from Scanning Electron Microscope (SEM). Invitro analysis reveals the good zone of inhibition for both gram positive and negative bacteria. The Copper nanoparticles (CuNPs) are mostly found and applied in the field of medicinal, electronic devices, biosensors, and anti-microbial agents.

**Keywords:** *Murraya Koenigii*, invitro, FTIR, EDS.

### Reference:

1. Singh P, Kim YJ, Zhang D, Yang DC. Biological synthesis of nanoparticles from plants and microorganisms. Trends in biotechnology. 2016 Jul 1; 34(7):588-99.
2. Iravani S. Green synthesis of metal nanoparticles using plants. Green Chemistry. 2011; 13(10):2638-50.
3. Suganya A, Murugan K, Kovendan K, Kumar PM, Hwang JS. Green synthesis of silver nanoparticles using *Murraya koenigii* leaf extract against *Anopheles stephensi* and *Aedes aegypti*. Parasitology research. 2013 Apr 1; 112(4):1385-97.

## STRUCTURAL AND OPTICAL PROPERTIES OF $\text{Cu}^{2+}$ AND $\text{Ni}^{2+}$ DOPED ZNS NONCRYSTALLINE THIN FILMS

P. Mythreye\* and R. Sakthi Sudar Saravanan

Department of Physics, Chikkanna Government Arts College, Tiruppur – 641602, Tamilnadu, India

\*E. Mail: mythreyep2018@gmail.com, Mobile: +91 8838102396

### Abstract

Pure and 5 mole %  $\text{Cu}^{2+}$  and  $\text{Ni}^{2+}$  doped Zinc Sulfide thin films were deposited by chemical bath deposition (CBD) technique using trisodium citrate as complexing agent instead of commonly used ammonia to avoid its toxicity and volatility during film preparation. Nanoparticles of pure and doped Zinc Sulfide (ZnS) have prepared by simple reaction between Zinc Acetate [ $\text{Zn}(\text{CH}_3\text{COO})_2 \cdot 2\text{H}_2\text{O}$ ], Copper acetate [ $\text{C}_4\text{H}_6\text{CuO}_4$ ], nickel acetate [ $\text{C}_4\text{H}_6\text{NiO}_4$ ], thiourea and trisodium citrate [ $\text{Na}_3\text{C}_6\text{H}_5\text{O}_7$ ] in aqueous solution at pH=10 and the bath temperature is maintained at 70°C. The structural properties of the prepared films are analyzed by X-ray diffraction (XRD). The chemical composition and optical properties of the obtained pure and Cu and Ni doped ZnS thin films are analyzed by UV-Vis absorption (UV-Vis.) and Energy Dispersive Analysis (EDX) of X-rays. The XRD analysis confirms the prepared thin films are in Cubic structure. Also, EDX pattern confirms the presence of dopant (Cu, Ni) components as well as the zinc to sulphide ratio is good stoichiometry. The optical analysis revealed that the prepared films exhibit direct band gap ( $E_g$ ) values.

**Keywords:** Thin film; CBD; ZnS; XRD; structural and optical properties

## IMPACT OF SOLAR ACTIVITY ON BACKGROUND RADIATION OF GOBI ARTS AND SCIENCE COLLEGE, GOBI CAMPUS

Kavippriya K, Banupriya R

PG and Research Department of Physics ,Gobi Arts and Science college, Gobichettipalayam , Tamil Nadu

### Abstract

Sun propagates vast amount of energy and plasma radiation through the interplanetary medium. It has been proved that the interaction of the solar wind plasma with Earth's magnetosphere produces the energy reconnection and hence energy coupling takes place. In the present work an attempt has been made to evaluate the effect of solar radiation levels on the background radiation (silver hills - Gobi Arts and Science College Campus). For this work, background radiation counts from GEIGER MULLER COUNTER experiment has been taken and it is to be evaluated and compared with the solar activity data which is available from [SOHO -Solar And Heliospheric Observatory]. The results will be finalized by end of February 2019.

**keywords:** Solar radiation , Geiger Muller Counter.

## STUDY ON RADIO REFRACTIVE INDEX FOR WEATHER FORECASTING

A.Prabhavathi, T.Venkatesan, P.Gowthaman, Haresh M.Pandya \*

Department of Physics ,Chikkanna Govt Arts College,Tirupur,Tamilnadu,India

\*Email:haresh.pandya@rediffmail.com

**Abstract**

Radio refractive index helps monitoring the weather forecasts and daily climatic changes. It mainly depends on the factors like Temperature, pressure, humidity and water vapour pressure. Based on these parameters a set data's has been collected for the five years (2010 – 2014) for the selected coastal areas - Chennai, Tuticorin, Kochi and Trivandrum - at sea level. Collected data's were analyzed using set of algorithms obtained from the earlier literatures. A computational model has been developed using MATLAB software for the ease of calculations. The obtained radio refractive index results are compared with climatic change on the selected coastal areas during 2010 - 2014. From the analysis results MATLAB modeling will be performed and compared with the radio refractive index values for year 2018.

### HYDROTHERMAL SYNTHESIS AND CHARACTERIZATION OF $\text{Cu}_2\text{ZnSnSe}_4$ CHALCOGENIDE NANOPARTICLES FOR SOLAR CELL APPLICATIONS

S. Gokilapriya<sup>1</sup>, G. Sahaya Dennish Babu\*

Department of Physics, Mahendra Arts and Science College, Namakkal – 637 501.

Department of Physics, Chettinad College of Engineering and Technology, Puliur-CF, Karur, Tamil Nadu – 639 114

\*Email: dennishbabu@chettinadtech.ac.in

**Abstract**

From the late 2000s, Copper Zinc Tin Selenide (CZTSe) which is a quaternary semiconducting compound has acknowledged with amazing attention for solar cell and other optoelectronics applications. Achieving a quaternary compound with perfect stoichiometry is still a challenging aspect in semiconductor manufacturing industries. Therefore, we have been made an attempt to synthesize CZTSe nanoparticles using simple hydrothermal method at 200°C/24 h in programmable controlled oven. The as-prepared CZTSe nanoparticles were characterized by X-ray diffraction, Raman spectroscopy, FESEM, energy dispersive spectroscopy and UV-Vis spectroscopy techniques. The obtained results show that the prepared tetragonal quaternary phase (CZTSe) was presented with kesterite crystal structure, a preferred one, which is very close stoichiometric relations to the reported research in the literature. The CZTSe nanoparticles synthesized in the present study exhibit anticipated properties in order to use them in solar cell applications. Details will be presented.

**Keywords:** Chalcogenide nanoparticles, XRD, Raman spectroscopy, Thermoelectrics, Solar cells

**References:**

1. I. Repins, C. Beall, N. Vora, C. DeHart, D. Kuciauskas, P. Dippo, B. To, J. Mann, W.C. Hsu, A. Goodrich, R. Noufi, Sol. Energy Mater. Sol. Cells 101, 154 (2012).
2. S. Bag, O. Gunawan, T. Gokmen, Y. Zhu, T.K. Todorov, D.B. Mitzi, Energy Environ. Sci. 5, 7060 (2012).

### COUPLING OF MODES MODEL OF A 150MHZ ST-X QUARTZ SAW DELAY LINE DEVICE FOR SENSOR SPECIFIC APPLICATIONS

Kokila S, Banu Priya R

Department of Physics, Gobi Arts and Science College, Gobi, Tamilnadu-638453.

Email: rithubanu@gmail.com

**Abstract**

Surface Acoustic Waves (SAWs) are elastic waves travelling along the surface of solid piezoelectric materials with amplitude that decays exponentially with depth. A SAW device is characterized in that a surface acoustic wave is electrically excited in a piezoelectric substrate by use of a metallic Interdigital Transducer (IDT). SAW devices found many applications as delay lines, filters, resonators, sensors. This paper presents the frequency response of a 150 MHz ST-X Quartz SAW delay line device fabricated with uniform IDTs. SAW device design parameters like piezoelectric substrate, structure of IDT, number of finger pairs, device frequency and etc., are optimized and its frequency response studied based on the Coupling of Modes Model via a unique custom made MATLAB algorithm. The results obtained are analyzed to ultimately help in the effective design, development and modelling of such devices for potential applications in specific sensors.

**Keywords:** Surface Acoustic Wave, Interdigital Transducer, Coupling of Modes Model

### A STUDY OF REMOTE SENSING SATELLITE DATA OF GREEN FOREST COVER IN TAMILNADU & KERALA DURING 2000-2015

R. Parameswari, Haresh M. Pandya\*

Department of Physics, Chikkanna Government Arts College, Tiruppur, Tamilnadu.

\*Email:haresh.pandya@rediffmail.com

**Abstract**

The forests in India are increasingly subjected to deforestation and degradation with adverse socio-economic and environmental impact. Advance knowledge of the quantum of human deforestation and its effect on other environmental related factors is absolutely necessary to take immediate drastic steps by the Government and the general population so as to preserve the natural habitat for future destructions. The present paper studies this effect of deforestation by measuring the rate of change of forest area calculated using remote sensing satellite data and images in the southern Indian states of Tamil Nadu and Kerala for a period of 15 years starting from 2000 to 2015. The research study also outlines the steps to be taken to arrest the degradation witnessed in these places.

**Keyword:** Deforestation, Remote Sensing, Geographic Information System.

**GREEN SYNTHESIS OF ZINC OXIDE NANOPARTICLES BY USING MORINGA OLEIFERA LEAVES**

R.Sandhiya, V. Kalaiselvi

Department of physics, Navarasam arts and Science College for Women, Erode

Email: nk.arthi.kalai@gmail.com; sandhiyaprabu11@gmail.com

**Abstract**

Nanotechnology is one of the most dynamic fields in advanced material science. The green synthesis is more advantageous over chemical and physical method as it is cost coefficient and eco friendly. Zinc oxide is widely used to treat a variety of skin conditions, including dermatitis, itching due to eczema, diaper rash and acne. In the present study synthesis of zinc oxide nanoparticle using leaf extract of moringa oleifera has been used. The prepared zinc oxide nanoparticles were characterized by X-ray diffraction (XRD), scanning electron microscopy (SEM), Energy dispersive X-ray analysis (EDAX), Fourier transform infrared spectroscopy (FT-IR) and Anti microbial activity. The results of antimicrobial activities revealed that maximum zones of inhibition was observed for gram positive bacteria (Staphylococcus aureus) and Gram negative bacteria (Escherichia coli). The zinc oxide can be applied with variety of skin conditions.

**Keywords:** Zinc oxide nanoparticles, moringa oleifera, eco friendly and antimicrobial activity.

**Reference:**

1. Elumalai K, Velmurugan S, Ravi S, Kathiravan V, Ashokkumar S. RETRACTED: Green synthesis of zinc oxide nanoparticles using Moringa oleifera leaf extract and evaluation of its antimicrobial activity.
2. Elumalai K, Velmurugan S. Green synthesis, characterization and antimicrobial activities of zinc oxide nanoparticles from the leaf extract of Azadirachta indica. Applied Surface Science. 2015 Aug 1;345:329-36.

**A VARIOUS CHARACTERISTICS OF DIFFERENT CERAMIC-POLYMER COMPOSITE**

T.Arulprakasam, V.Annamalai\*

Department of physics, Chikkanna Government Arts College, Tirupur, TN, India

Email: annamalai\_140795@yahoo.co.in

**Abstract**

Piezoelectric materials are decisive in sensor technology. In this paper the development of piezoelectric sensors and materials are studied. The piezoelectric and ferroelectric properties of PZT ceramic materials were also discussed. This review paper includes the comparison of piezoelectric ceramic-polymer composite sensors on the basis of connectivity of whole phases. The trending materials for sensor application are disputed. This study is proposed for further development in the area of piezoelectric sensors.

**Keywords:** Piezoelectricity, ferroelectricity, piezoelectric ceramics, sensors, PZT, piezoelectric composites, connectivity.

**GRAPHENE BASED SPR BIOSENSOR FOR SENSITIVITY EVALUATION**

K.Kaviyarasi, T.Abiramavalli, S. Subanya, K.B. Rajesh\*

Department of physics, PSGR Krishnammal College for Women, Coimbatore-641 004.

Department of physics, Chikkanna Government Arts College, Tiruppur - 641 602.

\*Email: rajeshkb@gmail.com

**Abstract**

In the recent years, the application of spr based fibre optic sensors have progressed very rapidly. Due to the increase in diseases and diagnostics, the urge for bio sensing applications have drawn the attention of researchers. A detailed numerical analysis on the performance parameter of an optical fibre based SPR sensors with Graphene layers over four different metals Pt/Au/Ag/Cu have been studied. Graphene not only helps in the adsorption of biomolecules due to pi-pi stacking interaction but also prevents metal oxidation. The thickness of the metal layer, its dielectric constants and the thickness, length and refractive index of the sensing layer is properly chosen and the sensitivity evaluation is done. The inclusion of Graphene layer is found to improve the sensitivity of the sensor. The attenuated total internal reflection method along with Krestschmann configuration has been employed for the evaluation. The effects of the metal structures considered and its thicknesses on the transmitted spectrum of the proposed sensor is analysed. Amongst the various chosen combinations, the proposed optimized Platinum Graphene coated SPR sensor demonstrates higher sensitivity than the previously reported spr sensors. The proposed configuration will surely be a promising candidate for high performance bio-sensing applications.

**Keywords:** Fiber optic sensors, surface Plasmon resonance, Krestschmann Configuration, dielectric constants, refractive index, sensitivity.

**AN OVERVIEW OF ZEOLITES AND THEIR APPLICATIONS**

T.Shanthini, P.Peulakumari\*

Department of Physics, Chikkanna Government Arts College, Tiruppur, Tamilnadu, India.

\*Email:peulakumari@gmail.com

**Abstract**

Zeolites are microporous, aluminosilicate materials used as commercial adsorbents and catalysts. There are about 40 naturally occurring Zeolites forming in sedimentary and volcanic rocks and 200 synthetic Zeolites are prepared artificially. They are used in petrochemical cracking, water softening and purification, removal of gases and solvents, agriculture, animal husbandry and construction. The three main uses of Zeolites are catalysis, gas separation and ion exchange. The characterization, Synthesis and their applications of Zeolites were discussed.

**Keywords:** Zeolites, Synthesis, Petroleum refining, Catalyst

### INVESTIGATIONS ON BINARY MIXTURES FORMED BETWEEN DOUBLE HYDROGEN BONDED LIQUID CRYSTALS

P. Sabeenadevia, G. Chandrasekara, N. Pongali Sathya Prabu  
Department of Physics, Gobi Arts & Science College, Gobichettipalayam  
Bannari Amman Institute of Technology, Sathyamangalam

#### Abstract

Double hydrogen bonded liquid crystals are formed between Methyl Malonic acid (MM) and p-n-alkyloxy benzoic acids (nOBA) and are characterized. Variation in the molar proportion of MM+nOBA ( $n = 7$ , and  $9$ ) exhibiting good phase polymorphism yields two different set of binary mixtures labeled as X and Y (where  $X = \text{MM} + 7\text{OBA}$  and  $Y = \text{MM} + 9\text{OBA}$ ) which yields five hydrogen bonded binary mixtures (0.1 to 0.5) as the result. Chemical, optical and thermal analysis is carried out for all the binary mixtures formed. Hydrogen bond existence and the chemical environment of the precursor are confirmed by Fourier Transform Infrared Spectroscopy (FTIR) and Nuclear Magnetic Resonance Spectroscopy (NMR) studies respectively. Phase variance (Nematic) and the corresponding transition temperatures of the binary mixtures are studied by the observation of textures through Polarizing Optical Microscope (POM) and the same is verified by recording the Differential Scanning Calorimetry (DSC). Phase diagram of the binary mixtures is built from the POM and DSC data. Thermal equilibrium, Odd-even effect, thermal stability factor, order of phase transition, stability of phase through enthalpy values and specific heat value possessed by the mixtures are derived from the DSC datum obtained.

### SYNTHESIS AND CHARECTERIZATION OF ZINC OXIDE NANO PARTICLES UNING PEEL EXTRACT OF LUFFA ACUTANGULLA

S.Reka ,N.Vidhya.  
Department of physics, Navarasam arts and science college for women, Erode.  
Email: vidhyasivam3@gmail.com,

#### Abstract

Nanotechnology is one of the leading scientific fields since it combines knowledge from the fields of Physics, Chemistry, Biology, Medicine, Informatics, and Engineering etc. Biological methods for nanoparticle synthesis using microorganisms, enzymes, and plants or plant extracts have been suggested as possible eco-friendly alternatives to chemical and physical methods. The Zinc oxide (ZnO) nanoparticles are known to be one of the multifunctional inorganic nanoparticles with effective antibacterial activity. In this present study, zinc oxides nanoparticles are formed by using zinc acetate dehydrate and peel extract of Ridge gaurd (luffa acutangulla) as a capping agent. The synthesised ZnO nanoparticles have been characterized by using various techniques like XRD, FTIR, SEM and EDAX. Further, Antimicrobial activity performed against gram positive staphylococcus aureus and gram negative pseudomonas aeruginosa bacteria's gives significant zone of innhibition.

**Keywords:** Green synthesis, Ridge guard, ZnO nano particle, Anti microbial activity.

#### Reference:

1. Beek.WJ, Wienk MM, Janssen RA. Efficient hybrid solar cells from zinc oxide nanoparticles and a conjugated polymer. Advanced Materials. 2004 Jun 17;16(12):1009-13.
2. Sangeetha G, Rajeshwari S, Venckatesh R. Green synthesis of zinc oxide nanoparticles by aloe barbadensis miller leaf extract: Structure and optical properties. Materials Research Bulletin. 2011 Dec 1;46(12):2560-6.
3. Sharma VK, Yngard RA, Lin Y. Silver nanoparticles: green synthesis and their antimicrobial activities. Advances in colloid and interface science. 2009 Jan 30;145(1-2):83-96.

### A REVIEW OF CHARACTERIZATION AND PROPERTIES OF NAX- ZEOLITE

A.Sangeetha, P. Peulakumari  
Department of Physics, Chikkanna Government Arts College, Tirupur, Tamil Nadu.  
Email:peulakumari@gmail.com

#### Abstract

Zeolites are aluminosilicate molecular sieves crystals that have uniform pores of molecular dimensions. They are used as adsorbents in separation and purification of advanced materials. In this paper NaX Zeolites are prepared by Sol-gel precursors. Sol-gel technique is simple, cost effective and affordable. The nano sized NaX-zeolite materials have major potential in separation, as well as catalysis, in gas separation mechanism and also in ion exchange. At this present work the properties and characterization of NaX- zeolites are studied.

**Keyword:** NaX- Zeolite, Sol-gel method , gas separation, ion exchange.

### THEORETICAL STUDIES ON ELECTRON LOCALIZATION AND STRUCTURAL PARAMETERS OF DEXPANTHANOL AND PANTOTHENIC ACID

P.Sivaranjani, M.Rajeswari, K.Anbazhagan  
Department of Physics, Gobi Arts & Science College, Gobichettipalayam  
Bannari Amman Institute of Technology, Sathyamangalam

#### Abstract

Organic acids are one of the major phytochemicals in vegetables and responsible for food taste and odor. Different organic acids are analyzed in fruits and cereals, but least in vegetables and spices. Organic acids have been analyzed because of their high importance in the formation of other phytochemical and increased antioxidant activity. The aim of the present study is to investigate the structural parameters (geometry, ground state energy, electron donating and accepting capability, electronegativity etc.). Density functional theory – a useful concept derived from quantum mechanics mainly focuses over the electronic density around the molecules is used in the present investigation. The geometry of the two vegetable acids are been optimized with the help of Beckes three parameters along with the functions of Lee-Yang and Parr using the triple zeta valence basis set 6-311G(d,p). Thermochemical calculations (frequency) is carried out under room temperature with 1 atmospheric pressure. In order to understand the occupied orbital levels frontier molecular orbital analysis(FMO) is done and corresponding energy gap  $E_{gap}$  between the energy levels is found. Electron donating capability and accepting capability of two flavonoids are been investigated with the help of molecular electrostatic potential (MEP). Based on the electron localization function visualization it is observed that the investigated similar parental conformations dextran and pantothenic acid are well stabilized and are capable of donating electron (good behavior to be an antioxidant) rather than accepting electron.

#### PZT-PVDF COMPOSITE WITH PIEZOELECTRIC CHARACTERISTIC STUDIES

G.Vinothkumar, R.Saranya, C.Karthick, V. Annamalai\*  
Department of Physics, Chikkanna Government Arts College, Tiruppur, TN, India  
\*Email: annamalai\_140795@yahoo.co.in

#### Abstract

PZT-PVDF materials have been used to fabricate a composite as a pellet using hot pressure apparatus. XRD were used to analyze the structure of composite. EDAX have been utilized to know the purity percentage of material. TAKE control piezometer has been used to study the capacitance and strain coefficient. The coercive field and magnetic induction have been plotted using P-E hysteresis loop device. Keyword: Composite, Piezometer, Hysteresis

#### INVITRO APPLICATION OF Zn DOPED CADMIUM OXIDE NANOPARTICLE AND ITS ANTIBACTERIAL ACTIVITY

S.Lavanya, P. Sudha  
Department of physics, Navarasam Arts and Science College for Women, Erode  
Email: sudhainfo123@gmail.com,

#### Abstract

Zn doped cadmium oxide nano particle were prepared by chemical Co-precipitation method. The doped nanoparticle were synthesised by chemical Co –precipitation method associated with microwave irradiation method. The prepared Zn doped CdO was characterised by XRD, FTIR, SEM, EDAX, UV and Antibacterial. The X-ray diffraction (XRD) pattern analysis reveals crystal structure Zn doped cadmium. The FTIR pattern represents the functional groups of the prepared sample. The morphology and purity of sample was analysed by using Scanning Electron Microscopy (SEM) and Energy Dispersion X-ray Diffraction (EDAX) analysis. The optical properties carried out by ultra-violet spectroscopy (UV). The Antibacterial Activity of the nanoparticles with gram positive (*Bacillus subtilis*) and gram negative (*Pseudomonas Aeruginosa*) bacteria. The results are matches well with standard values.

**Keywords:** CdO: Zn, Antibacterial activities, EDX, UV –spectrum.

#### Reference:

- [1] AN Ejehie; Z Banan, Desalination., 2011, 279, 146-151.
- [2] N Rajkumar; VM Susila; K Ramachandran, J. Exp. Nanosci., 2011, 6, 389-398.
- [3] PH Jefferson; SA Hatfield; TD Veal; PDC King; CF Mc Connville; JZ Perez; VM Sanjose, Appl. Phys. Lett., 2008, 92, 022101.
- [4] A Tadjarodi; M Imani; H Kerdari; K Bijanzad; D Khaledi; M Rad, Nanomaterials and Nanotechnology., 2014, 4, 1-10.
- [5] T Ahmad; S Khatoon; K Coolahan; SE Lofland, J. Mater. Res., 2013, 28, 1245-1253.

#### SYNTHESIS AND CHARACTERIZATION OF WHEAT STARCH :POLY VINYL ALCOHOL:LiCl BIODEGRADABLE GEL POLYMER ELECTROLYTE

Makeshwari.C, Udhayakumar.E  
Department of Physics, Gobi Arts and Science College, Gobi, Tamilnadu-638453.  
Email: udhaya14591@gmail.com

#### Abstract

Starch is the most abundant and in expensive biopolymer. PVA is a water soluble synthetic polymer which forms copolymers of vinyl alcohol and vinyl acetate. A blend composing PVA and wheat starch along with LiCl with varied weight percentage was prepared using solution casting technique. The prepared biopolymer membranes are analyzed for their crystallinity, i.e they are doped with crystalline LiCl. Increase in crystalline nature restricts ionic movement inside the membrane hence it is necessary for them to exhibit amorphous nature which favors conductivity. Incorporation of lithium ions inside the polymer chain will be examined with the help of vibrational assignment observed from Fourier Transform Infrared Spectrograph. After this the synthesized gel polymer electrolytes will be taken for AC impedance analysis to find the dielectric behaviour and conductivity. Based on the observations from morphological, vibrational and electrical characterizations, the results will be finalized.

## EFFECT OF ANNULAR OBSTRUCTION ON TIGHT FOCUSING PROPERTIES OF AZIMUTHALLY POLARIZED DOUGHNUT GAUSSIAN BEAM

K.Geetha, K. Prabakaran\*, K.B. Rajesh,

Department of Physics, Mahendra Arts and Science College (Autonomous), Namakkal, Tamilnadu, India

Department of Physics, Chikkanna Government Arts College, Trippur, Tamilnadu, India

\*Email:prabakaran27mar@gmail.com

### Abstract

Based on vectorial diffraction theory, the effect of annular apodization on tightly focused azimuthally polarized doughnut Gaussian beam are investigated theoretically using vector diffraction theory. The results show that our proposed system generates a sub wavelength focal hole having large uniform focal depth of incident beam with annular aperture for lower NA. Such kind of subwavelength focal segment may find wide applications in optical traps, biological applications, atmospheric sciences and optical manipulation technology.

**Keywords:** Vector diffraction theory, Azimuthally polarized beam, Optical Trapping.

## GENERATION OF 3D MULTIPLE FOCAL SPOT SEGMENTS BY ANNULAR WALSH FILTER

N. Umamageswari, D.Thiruarul, V.Prakashraj , K.B.Rajesh\*, Haresh.M.Pandya

Department of Physics, R and D Centre Bharathiar University, Coimbatore ,India

Department of Physics, Chikkanna Government Arts College, Tiruppur, Tamilnadu,

\*Eail:Indiarajeshkb@gmail.com

### Abstract

Annular Walsh filters, derived from the annular Walsh functions which form a complete set of orthogonal Phase filters that take on values either 0 or  $\pi$  phase, corresponding to +1 or -1 over the domain specified by the inner and outer radii of the annulus. The annular Walsh function is taken as zero from the centre of the circular aperture to the inner radius of the annulus. The three values 0, +1, and -1 in an annular Walsh filter corresponding annular to zero amplitude (i.e., an obscuration), unity amplitude and zero phase, and unity amplitude and  $\pi$  phase, respectively. The size of the inner radius of the annulus provides an additional degree of freedom in tailoring of point spread function by using these filters for pupil plane filtering in imaging systems. Self-similarity can also be observed in the corresponding axial intensity distributions. It is observed that by properly tuning the Annular Walsh filter one can generate three dimensional multiple focal spot segments as well as optical needle in the optical axis are obtained. We expect that such three dimensional focal structures are useful for nano-lithography, particle trapping and transportation, as well as confocal and STED microscopy, optical super-resolution, optical micro-manipulation, optical tomography, microstructure fabrication and so on.

**Keywords:** Annular Walsh Filters, Self-Similarity, High NA Parabolic Mirror.

## PREPARATION OF CuO/SiO<sub>2</sub> MICROSPHERES

R.P.Mythili, S.Thilagavathi.

Department of Physics, Gobi Arts and Science College, Gobichettipalayam, Tamilnadu, India.

### Abstract

Porous CuO/SiO<sub>2</sub> hollow micro spheres were synthesized by an impregnation method using pure SiO<sub>2</sub> hollow spheres as the supporter and Cu species as the functional material. The hollow micro spheres were characterized by X-Ray diffraction, BET surface area, temperature- Programmed reduction, TEM, SEM. The catalytic activities of the CuO/SiO<sub>2</sub> hollow micro spheres were investigated by the removal of the total Chemical Oxygen Demand [COD]. The influence of various reaction parameters such as the reaction temperature, the partial pressure of O<sub>2</sub> and the initial pH of the solution was studied. The co-ordination, dispersion and aggregation of the copper species on porous materials play an important role for the COD.

## SYNTHESIS AND CHARACTERIZATION OF FE DOPED MANGANESE OXIDE NANOPARTICLES USING CHEMICAL PRECIPITATION TECHNIQUE

S.Varshaa, S.Sasikala

Department of physics, Navarasam arts and science college for women, Erode.

Email: sasiphysics86@gmail.com

### Abstract

Nanoparticle research is currently an area of intense scientific research due to wide variety of potential applications in biomedical, optical and electronic fields. The morphology of manganese oxide nanoparticles is high surface area, and they appear in a solid green powder form. They are graded as an irritant and can cause skin, eyes and breathing irritations. Among chemical route, chemical precipitation method is a simple technique which is given more priority due to its low cost, few remains after calcinations and easy industrialization. In the present study the pure and Fe doped Manganese nanoparticles were successfully synthesized by using chemical precipitation method. The synthesized nanoparticles characterized using XRD, SEM, EDAX, UV. The results are well matched with standard values.

**Keywords:** Manganese, ferric chloride, chemical precipitation, UV.

### Reference:

- [1] G A Somorjai (1997), Applied Surface Science, 121, pp. 1-19.
- [2] C A Stowell and B A Krogel (2005), Nano Letters, 5, pp. 1203-1207.
- [3] V Subramanian, E E Wolf and P V Kamat (2006), J. of the American Society, 126, pp. 4943-4950

**A REVIEW ON NOVEL AUTOMATED SPRAY COATING OF TiO<sub>2</sub> THIN FILMS**

P.M.Jothimani, R.Deepa, V.Senthilnathan\*

Department of physics, Chikkanna Government Arts College, Tirupur, TN, India

Department of physics, Government Arts College, Udumalaipettai, TN, India

\*Email:nathas.com@gmail.com

**Abstract**

The novel automated spray coating of thin films has very good thin film quality results compared to normal manual spray coatings. The process and cost of automation is considerably reduced with the help of microcontroller circuits. In this various components are integrated, which are cost effective and versatile. Micro controlled step motor is used to obtain automated spray coating device. It is used to make thin films for sensors, solar cell thin film layers and its multilayer coatings. The ranges of spray distance, time of spray are varied from slow to high speeds. It has continuous spray and intermittent spray durations. The spray coater is excellent, for reproducibility and repeatability of thin film qualities. In this paper, the various spin coating devices and the prepared TiO<sub>2</sub> thin films (structure and size of particle) are discussed.

**SYNTHESIS ,GROWTH AND CHARACTERIZATION OF L-ASPARAGINE MONOHYDRATE DOPED WITH THIOUREA A SINGLE CRYSTAL**

M.K. Eniya, P. Valarmathi

Department of Physics, Gobi Arts and Science college, Gobichettipalayam, Tamilnadu

**Abstract**

L-asparagine Thiourea monohydrate (LATM) single crystal grown from aqueous solution by slow evaporation method. The grown crystals were characterized by power X-ray diffraction method. The analysis confirmed that the crystal belongs to orthorhombic crystal system. The UV-visible transmittance spectrum shows that the material has wide optical transparency in the entire visible region. The relative second harmonic generation was confirmed by kurtz powder technique. The FTIR spectrums of all grown crystals are recorded in the KBR pellet technique. The asymmetric NH<sub>2</sub> stretching vibration of thiourea in LATM appeared slightly at higher frequency than that of pure thiourea.

**GREEN SYNTHESIS AND CHARACTERIZATION OF ZINC OXIDE NANOPARTICLE USING SESBANIA GRANDIFLORA LEAF EXTRACT AS REDUCING AGENT**

T.Swathi, V.Ramya

Department of physics, Navarasam arts and science college for women,Erode.

Email: ramyaphy94@gmail.com

**Abstract**

Nanomaterial is defined as a "material with any external dimension in the nanoscale or having internal structure or surface structure in the nanoscale", with nanoscale defined as the "length range approximately from 1 nm to 100 nm". Zinc oxide can be called a multifunctional material having unique physical and chemical properties. Ceramic industry has a number of uses for zinc oxide powder. In this present work, zinc oxide nanoparticle was successfully prepared by using green synthesis method. The synthesis of zinc oxide nanoparticles from different concentration of sesbania grandiflora leaf extract using zinc acetate dehydrate as precursor materials and synthesized nanoparticles were characterized by using various techniques like, UV, FTIR, XRD, SEM and EDS and antibacterial activity was investigated using gram positive and negative bacteria's such as, staphylococcus aureus and Escherichia coli.

**Keywords:** Zinc oxide, Sesbania grandiflora, UV, Antibacterial**Reference:**

- 1) Sorna prema rajendran and kandasamy sengodan, received 22 june 2016; accepted 18 december 2016; published 3 january 2017; academic editor: sanjeeb k.sahoo.
- 2) J.S. KIM, E.Kuk, K.N.yu et al., "antimicrobial effects of silver nanoparticles," nano meditation: nanotechnology, biology and medicine, vol.3, no.1, pp.95-101, 2007

**THEORETICAL STUDIES ON MOLECULAR DESCRIPTORS AND NBO PROPERTIES OF DIHYDROXYASCORBIC ACID AND 5-1RD4T**

L.Ambika, M.Rajeswari, K.Anbazhagan

Department of Physics, Gobi Arts &amp; Science College, Gobichettipalayam.

Bannari Amman Institute of Technology, Sathyamangalam.

**Abstract**

Ascorbic acid (vitamin C) is used to prevent or treat low levels of vitamin C in people who do not get enough of the vitamin from their diets. Most people who eat a normal diet do not need extra ascorbic acid. Low levels of vitamin C can result in a condition called scurvy. Scurvy may cause symptoms such as rash, muscle weakness, joint pain, tiredness, or tooth loss. Vitamin C plays an important role in the body. It is needed to maintain the health of skin, cartilage, teeth, bone, and blood vessels. It is also used to protect your body's cells from damage. It is known as an antioxidant. In the present investigation structural parameters and binding energies of well known antioxidant ascorbic acid is compared with its similar structural conformer 51RD4T. Density functional

theory – a useful concept derived from quantum mechanics mainly focuses over the electronic density around the molecules is used in the present investigation. The geometry of the two vegetable acids are been optimized with the help of Beckes three parameters along with the functions of Lee-Yang and Parr using the triple zeta valence basis set 6-311G(d,p). Thermo-chemical calculations (frequency) is carried out under room temperature with 1 atmospheric pressure. In order to understand the occupied orbital levels frontier molecular orbital analysis(FMO) is done and corresponding energy gap  $E_{gap}$  between the energy levels is found. Electron donating capability and accepting capability of two flavonoids are been investigated with the help of molecular electrostatic potential (MEP).

### A REVIEW ON NOVEL AUTOMATED SPIN COATING OF TiO<sub>2</sub> THIN FILMS

P.Vijayalakshmi, S.Priya, V.Senthilnathan\*

Department of physics, Chikkanna Government Arts College, Tirupur, TN, India

Department of physics, Government Arts College, Udumalaipettai, TN, India

\*Email:nathas.com@gmail.com

#### Abstract

The novel automated spin coating of thin films has very good thin film quality results compared to normal manual spin coatings. The process and cost of automation is considerably reduced with the help of microcontroller circuits. In this various components are integrated, which are cost effective and versatile. Micro controlled step motor is used to obtain automated spin coating device. It is used to make thin films for sensors, solar cell thin film layers and its multilayer coatings. The range of spin speed is varied from slow to very high speeds. The spin coater is excellent, for reproducibility and repeatability of thin film qualities. In this paper, the various spin coating devices and the prepared TiO<sub>2</sub> thin films (structure and size of particle) are discussed.

### EFFECT OF KINETIC ENERGY OVER STRUCTURAL PROPERTIES OF PECTIN AND QUINNIC ACID-A DFT STUDY

V.Mohanadevi, M.Rajeswari, K.Anbazhagan

Department of Physics, Gobi Arts & Science College, Gobichettipalayam.

Bannari Amman Institute of Technology, Sathyamangalam.

#### Abstract

Fruits and vegetables are universally promoted as healthy. The Dietary Guidelines for Americans 2010 recommend you make one-half of your plate fruits and vegetables. Myplate.gov also supports that one-half the plate should be fruits and vegetables. Fruits and vegetables include a diverse group of plant foods that vary greatly in content of energy and nutrients. Additionally, fruits and vegetables supply dietary fiber, and fiber intake is linked to lower incidence of cardiovascular disease and obesity. Fruits and vegetables also supply vitamins and minerals to the diet and are sources of phytochemicals that function as antioxidants, phytoestrogens, and antiinflammatory agents and through other protective mechanisms. In the present investigation pectin and quinnic acid two well known vegetable acids are been investigated for structural properties of kinetic energy distribution. Density functional theory – a useful concept derived from quantum mechanics mainly focuses over the electronic density around the molecules is used in the present investigation. The geometry of the two vegetable acids are been optimized with the help of Beckes three parameters along with the functions of Lee-Yang and Parr using the triple zeta valence basis set 6-311G(d,p). Thermo-chemical calculations (frequency) is carried out under room temperature with 1 atmospheric pressure. In order to understand the occupied orbital levels frontier molecular orbital analysis(FMO) is done and corresponding energy gap  $E_{gap}$  between the energy levels is found. Electron donating capability and accepting capability of two flavonoids are been investigated with the help of molecular electrostatic potential (MEP). Based on the kinetic energy distribution it is evident that the observed results are in line with the observations made for MEP, FMO and molecular descriptor analysis where hydroxyl and carboxyl units posses much electronic movement and are highly unstable making them to easily donate electron.

### GREEN SYNTHESIS OF ALUMINIUM NANOPARTICLES BY USING AERVA LANTA EXTRACT

Gothavari M and Priyadharsini T.N\*

Department of Physics, P.K.R. arts college for women, Gobichettipalayam

\*E Mail: tnpriya27@gmail.com,

#### Abstract

A green root synthesis of aluminium oxide nano particles was achieved using aerva lanta as a reducing agent .Nano particles produced from the leaves are more stable. It was confirmed that the rate of synthesis is faster when compared to others. The formation of Al nano particles were monitored through the colour change occurred during the incubation period. For synthesis of Al nano particles, fresh leaves extract of aerva lanta was used. The formation of nano particles has been confirmed through X-ray diffraction, UV-visible, FTIR.

**Keywords:** Nanoparticles, Green synthesis, Incubation period.

### GREEN SYNTHESIS AND CHARACTERIZATION OF IRON OXIDE NANOPARTICLE USING SESBANIA GRANDIFLORA LEAF EXTRACT AS REDUCING AGENT

E.Gokulapriya, V.Ramya

Department of physics, Navarasam arts and science college for women,Erode.

Email:gokulapriyaaswaran1997@gmail.com

**Abstract**

Nanomaterials are chemical material are manufactured and used at a very small scale. Iron is the transition metals and the fourth most plentiful element in the earth's crust and is the structural backbone of our modern infrastructure. Iron oxide used in plastics, nanowires coatings, nanofibers and textiles. In this present study of iron oxide nanoparticle were successfully prepared by using green synthesis method. The iron oxide nanoparticles from different concentration of sesbania grandiflora leaf extract (20ml) with ferrous chloride as precursor materials have been synthesized. Since the prepared nanoparticle were characterized by using different techniques like XRD, FTIR, UV, SEM and EDS and additionally antibacterial activity was performed against gram positive staphylococcus aureus and gram negative Escherichia coli.

**Keywords:** Zinc oxide, Sesbania grandiflora, UV and Antibacterial

**Reference:** 1) Sorna prema rajendran and kandasamy sengodan, received 22 june 2016; accepted 18 december 2016; published 3 january 2017; academic editor: sanjeeb k.sahoo. 2) G.Xiong,U.Pal,J.G.Serrano,K.B.Ucer,and R.T.Williams,"Photoluminescence and FTIR study of ZnO nanoparticles".the impurity and defect perspective,"physica status solidi(c),vol.3,no.10,pp.3577-3581,2006

### OPTICAL AND THERMAL PROPERTIES ANALYSIS OF HYDROGEN BONDED LIQUID CRYSYAL BINARY MIXTURES

C. Ganeshamoorthy, G. Chandrasekara, N. Pongali Sathya Prabu  
Department of Physics, Gobi Arts & Science College, Gobichettipalayam  
Bannari Amman Institute of Technology, Sathyamangalam

**Abstract**

Binary complexes of thermotropic liquid crystal comprising of Methyl Malonic Acid (MM) and p-n-alkyloxy Benzoic Acids (nBAO) are investigated in the present work. Hydrogen bond existence and the chemical environment of the precursor are confirmed by Fourier Transform Infrared Spectroscopy (FTIR) and Nuclear Magnetic Resonance Spectroscopy (NMR) studies respectively. Mesophases of the binary complex comprises of conventional phases such as nematic, smectic C and smectic G whose textural observations are confirmed by Polarizing Optical Microscopic (POM) studies. The transition temperatures corresponding to the individual mesophases are verified by Differential Scanning Calorimetric (DSC) studies. Thermal equilibrium, thermal stability factor, and order of phase transition data for all the binary complexes are deduced from DSC data.

### GROWTH AND CHARACTERIZATION OF CYCLOHEXYLAMMONIUM HYDROGEN MALEATE CRYSTALS FOR NONLINEAR OPTICAL APPLICATIONS

R. Gomathi, S. Madeswaran\*, D. Rajan Babu  
Vellore Institute of Technology, Vellore, Tamil Nadu, India  
Sree Narayanaguru Arts and Science College, Coimbatore, Tamil Nadu, India  
\*Email: madeswaran.s@vit.ac.in

**Abstract**

Cyclohexylammonium hydrogen Maleate Crystal (CYHM) was grown by slow evaporation method. The crystal structure was determined using single Crystal XRD analysis. CYHM belongs to monoclinic crystal system with the cell parameter values of  $a = 24.25 \text{ \AA}$ ,  $b = 5.50 \text{ \AA}$ ,  $c = 18.61 \text{ \AA}$ ,  $\alpha = 90^\circ$ ,  $\beta = 111.22^\circ$  and  $\gamma = 90^\circ$ . The UV-Vis-NIR studies reveal that CYHM has wide transparency in the entire visible region. The TGA-DSC spectrum shows that the material has the melting point of  $112^\circ\text{C}$ . The dielectric studies reveal that the material exhibits normal dielectric behavior. The third order nonlinear optical studies were carried out using Z-scan analysis. The Optical limiting spectrum shows that CYHM has best optical limiting property which is used to protect human eyes and photo sensors.

### THERMAL AND OPTICAL ANALYSIS OF HYDROGEN BONDED LIQUID CRYSTALS IN BINARY MIXTURES

P. Saranya, G. Chandrasekar, N. Pongali Sathya Prabu  
Department of Physics, Gobi Arts & Science College, Gobichettipalayam  
Bannari Amman Institute of Technology, Sathyamangalam

**Abstract**

Liquid crystalline mesogens formed between Methyl malonic acid (MM) and p-n-alkyloxy benzoic acids (nBAO,  $n = 5$  to  $12$ ) exhibit rich phase polymorphism. Eagerness in investigating the mesogenic thermal range of individual mesophases and to analyze the optical and thermal properties exhibited by them lead to the preparation of different binary mixtures between the above said mesogenic complexes. MM+7BAO and MM+12BAO are chosen to prepare the binary mixtures as they possess rich mesogenic properties. Four such binary mixtures are prepared by varying the molar ratio in steps of 0.6 to 0.9. Nematic and Smectic B are the two mesophases obtained in the present binary mixtures. Polarizing Optical Microscope (POM) is utilized to identify the textures of the mesophases and the transition temperatures. To evaluate the enthalpy value and the order of mesophase transition, thermograms obtained from Differential Scanning Calorimetry (DSC) are examined. Phase diagram of the binary mixtures obtained is constructed from the POM and DSC data.

**Keywords:** Hydrogen bond, Binary mixtures, Thermal stability, Specific heat.

### GREEN SYNTHESIS AND CHARACTERIZATION OF ZINC OXIDE NANOPARTICLES BY USING AZADIRACHTA INDICA LEAVES

Monisha.M, Kalaiselvi.V  
 Department of physics, Navarasam arts and Science College for Women, Erode  
 Email: nk.arthi.kalai@gmail.com

#### Abstract

Nanomaterials is the branch of technology that deals with dimensions and tolerances of less than 100 nanometres, especially the manipulation of individual atoms and molecules. The biosynthesis of nanoparticles has been proposed as a cost-effective and environmentally friendly alternative to chemical and physical methods. The present work, described the synthesis of zinc oxide nanoparticles using leaf aqueous extract of *Azadirachta indica* and its antimicrobial activities. The synthesised nanoparticles have been characterized by using X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), Scanning electron microscope (SEM) analysis, Energy dispersive X-ray analysis (EDAX). In this study we also investigated antimicrobial activity of green synthesized zinc oxide nanoparticles. The results of antimicrobial activities revealed that maximum zones of inhibition was observed for Gram positive bacteria (*Staphylococcus aureus*) than Gram negative bacteria (*Escherichia coli*).

**Keywords:** Zinc Oxide, green synthesis, XRD, FTIR, EDAX, Antimicrobial activity.

#### Reference:

1. Elumalai K, Velmurugan S. Green synthesis, characterization and antimicrobial activities of zinc oxide nanoparticles from the leaf extract of *Azadirachta indica* (L.). *Applied Surface Science*. 2015 Aug 1;345:329-36.
2. Mankad M, Patil G, Patel S, Patel D, Patel A. Green synthesis of zinc oxide nanoparticles using *Azadirachta indica* A. Juss. leaves extract and its antibacterial activity against *Xanthomonas oryzae* pv. *oryzae*.

### STRUCTURAL AND MORPHOLOGICAL CHARACTERIZATION OF SN-CO-FE TERNARY ALLOYS

M.Reka, M.Mohanasri, M.Ezhil Inban, P. Rajesh, K.Antonyraj, N.Vignesan  
 Department of Physics, Government arts College, Coimbatore  
 Department of chemistry, Government arts College, Coimbatore  
 Email: jayanthireka1997@gmail.com

#### Abstract

This paper is reports to synthesis Sn-Co-Fe ternary alloys on copper substrate with sulphate bath using electrodeposition technique. Structural and morphological properties of the alloys were confirmed using X-Ray diffractogram and SEM micrographs. Structural studies exposes the crystalline nature in the films. The morphology of the deposits confirms the formation of uniform and bright deposition. And elements in the films were studied and confirmed by employing EDAX analysis. Also the obtained EDAX pattern endorses the presence related peaks. This type of films has great prospective in technological applications, mainly in the field of Magnetic sensor devices.

**Keywords:** Electrodeposition, Ternary alloys, Magnetic alloys, magnetic properties.

### SYNTHESIS ,GROWTH AND CARACTERIZATION OF GLYCINE AND THIOUREA DOPED WITH AMMONIUM ACETATE SINGLE CRYSTALS

R.Jayasankari,P.valarmathi  
 Department of Physics,Gobi Arts and Science College,Gobichettipalayam,Tamilnadu

#### Abstract

Single crystals of Glycine and Thiourea doped with Ammonium Acetate grown from aqueous solution by slow evaporations. The grown crystals were determined by x-ray powder diffraction, and the peaks observed for different diffraction planes exist in the crystal. The lattice parameter values are in-line with the literature values. The XRD spectrum of the grown crystals reveals monoclinic system. The various functional groups are identified by FTIR spectrum. The grown crystal had good optical transmittance in UV-vis region, and the lower cutoff wavelength was 236nm, which is one of the mandatory requirements for NLO properties.

### SYNTHESIS AND CHARACTERIZATION OF ZINC OXIDE NANOPARTICLES USING FLOWER EXTRACT OF CASSIA AURICULATA

K.Karthika, S.Shanmathi  
 Department of physics, Navarasam arts and science collage for women, Erode.  
 Email:shanmathi.gsm@gmail.com

#### Abstract

Nanotechnology is defined as the study and use of structures between 1 nanometer to 100 nanometers in size. Biogenic reduction is a "Bottom Up" approach similar to chemical reduction where a reducing agent is replaced by extract of a natural products with inherent stabilizing, growth terminating and capping properties. Zinc oxide nanoparticles are known to be one of the multifunctional inorganic nanoparticles with effective antibacterial activity. In this present study, zinc oxide (ZnO) nanoparticles are produced by using zinc acetate dehydrate and flower extract of *Cassia auriculata* (Tanners cassia) as the capping agent. The synthesised ZnO nanoparticles have been characterized by X-Ray Diffraction (XRD), this analysis gives the structure of the prepared ZnO particles. Fourier Transform Infrared Spectroscopy (FTIR) reveals the functional group present in the prepared sample. Scanning Electron Microscopy (SEM) and Energy Dispersive X-Ray Microscopy (EDAX), analysis reveals the purity and morphological structure of the sample. UV-visible spectroscopy reveals the band gap energy of the prepared ZnO nano particles (NPs). Further, Antimicrobial activity of the ZnO nanoparticles with both gram positive bacteria of *Staphylococcus epidermis* and gram negative bacteria of *Escherichia coli*. The results are well matched with standard values.

**Keywords:** Zinc oxide nanoparticles, Antimicrobial, green synthesis, cassia auriculata.

**SYNTHESIS ,GROWTH AND CHARACTERIZATION OF L-ARGININE MONOHYDRATE DOPED WITH THIOACTAMIDE A SINGLE CRYSTAL**

Manjula.V, Valarmathi.P

Department of physics, Gobi Arts and Science College, Gobi, Tamil Nadu, India.

**Abstract**

The starting material L-arginine and thiactamide were taken in the equivalent ratio(1:1). The aqueous solution can be super-saturated after a few days nucleation was observed with in five days. The crystal is formed by after 15 days . After the crystal formation the crystal analysis by various methods. The powder XRD analysis is confirmed that the crystal belong to orthorhombic crystal system. The functional groups in the grown crystal have been confirmed by FTIR spectral analysis. The UV absorption spectrum confirms the quality optical transparency.

**PREPARATION OF BIODIESEL FROM VARIOUS COOKING OILS**

M.Ananthapriya, S.Sasikala

Department of physics, Navarasam Arts and Science College for Women, Erode

Email:ananthapriya2017@gmail.com

**Abstract**

Vegetable oil is a renewable starting material as it is derived from growing plants, rather than irreplaceable materials like the earth's petroleum and natural gas supplies. We have performed experiments for the synthesis of biodiesel from different vegetable oils including blended oil. Confirmation of biodiesel was done by using FT-IR spectrometer. The reaction is catalysed by NaOH making this process economically viable for the industrial scale production of biodiesel. A yield of 85wt% biodiesel was achieved from blended oil. One step of trans-esterification process is carried out since the FFA value is below 3%. The percentage of glycerine obtained was 2.9g for blended oil. The economic benefits include support to the agriculture sector, tremendous employment opportunities in plantation and processing.

**Keywords:**Vegetable oil, Blended oil Trans-esterification, FT-IR spectrometer, FFA value

**A REVIEW ON NOVEL AUTOMATED DIP COATING OF TiO<sub>2</sub> THIN FILMS**

M.Mullai, V.Senthilnathan\*

Department of physics, Chikkanna Government Arts College, Tirupur, TN, India

Email:nathas.com@gmail.com

**Abstract**

The novel automated dip coating of thin films has very good thin film quality results compared to normal manual dip coatings. The process and cost of automation is considerably reduced with the help of microcontroller circuits. In this various components are integrated, which are cost effective and versatile. Micro controlled step motor is used to obtain automated dip coating device. It is used to make thin films for sensors, solar cell thin film layers and its multilayer coatings. This is also used to coat thin film of photo resist material such as alumina with poly ethylene glycol. The range of dipping speed is varied from 1 to 100 mm per second. The dip coater is excellent, for reproducibility and repeatability of thin film qualities. In this paper, the various dip coating devices and the prepared TiO<sub>2</sub> thin films (structure and size of particle) are discussed.

**CHARACTERIZATION OF Sb DOPED SnO<sub>2</sub> THIN FILMS**

S. Dharanya \* and A. Priyadarshini

Department of Physics, Gobi Arts &amp; Science College, Gobi.

**Abstract**

Tin oxide (SnO<sub>2</sub>) thin films were prepared by sol-gel method. In this present work preparation and characterization of doped tin oxide (sb:SnO<sub>2</sub>) thin film used for gas sensing applications. These films were characterized by XRD and SEM. The SEM images of films showed a very smooth surface morphology with nanostructured grain size in the range of 40 to 45nm. Sensing ability of (Sb:SnO<sub>2</sub>) films were much higher than undoped films. The structural, electrical and optical properties of these films have been investigated with respect to aniline time and temperature.

**Keywords:** Thin film, Sol-gel, XRD.

**INVESTIGATION ON BIODIESEL FROM WASTE COOKING OILS**

T.M.Neethu, V.Kalaiselvi

Department of physics, Navarasam Arts and Science College for Women, Erode

Email:neethumanoharan1997@gmail.com

**Abstract**

Biodiesel production from waste oils is an attractive option to produce biodiesel economically. Present investigation deals with the utilization of waste cooking oil (WCO) for the production of biodiesel. Methanol was used as a reactant KOH was used as a base catalyst. Confirmation of biodiesel was done using FT-IR spectrometer. A yield of 96wt% was achieved from waste oil. Since FFA value is below than 3%, single step of trans-esterification is carried out for the process. The percentage of glycerine obtained was 7.26wt% for waste oil. The use of biodiesel resulted in lower emissions of unburned hydrocarbons, carbon monoxide, and particulate matter. Chemical characterization also revealed lower levels of some toxic and reactive hydrocarbon species when biodiesel fuels were used.

**Keywords:** Waste oils, Trans-esterification, Emissions, FT-IR spectrometer, FFA value.

## STRUCTURAL ACTIVITY AND TARGET PREDICTION ANALYSIS OF PELARGONIDIN AND PELARGONIDIN 3 O GLUCOSIDE

M.Selvanayagi, M.Rajeswari, K.Anbzhagan.,  
Department of Physics, Gobi Arts & Science College, Gobichettipalayam.  
Bannari Amman Institute of Technology, Sathyamangalam.

### Abstract

Flavonoids are vital regulators of human health since the dawn of human race. Being secondary metabolites they have been taken in different forms from plants, fruits and vegetables. They are also available in human body. They themselves concentrate over secondary growth activities of human body and prevents body from the free radicals. The hydroxyl units present in the flavonoids act as radical scavenging units i.e through H-atom donation. A detailed study over their structural activity will help us to understand their activity in promoting good health. In the present two flavonoids (pelargonidin and pelargonidin 3 O glucoside) of same parental connectivity are been considered for theoretical investigation of the structural activity and their nomination towards the pathogenic targets. Density functional theory – a useful concept derived from quantum mechanics mainly focuses over the electronic density around the molecules is used in the present investigation. The geometry of the two flavonoids are been optimized with the help of Beckes three parameters along with the functions of Lee-Yang and Parr using the triple zeta valence basis set 6-311G(d,p). Thermochemical calculations (frequency) is carried out under room temperature with 1 atmospheric pressure. In order to understand the occupied orbital levels frontier molecular orbital analysis(FMO) is done and corresponding energy gap Egap between the energy levels is found. Electron donating capability and accepting capability of two flavonoids are been investigated with the help of molecular electrostatic potential (MEP). The results visualized from MEP depicts that the hydroxyl units present in the B-ring highly active and those present in A-ring are least active. For glycosyl flavonoid same observation is been made and glycosyl unit seems to be highly distortive(unstable – high kinetic energy). From the target prediction analysis pelargonidin 3-O glucoside seems to posses higher probability towards targets which is an interesting observation when compared to its parent pelargonidin.

## TIGHT FOCUSING PROPERTIES OF RADIALLY POLARIZED DOUGHNUT GAUSSIAN BEAM THROUGH A DIELECTRIC INTERFACE

G.Sharmila, K. Prabakaran\*, K.B. Rajesh,  
1Department of Physics, Mahendra Arts and Science College (Autonomous), Namakkal, Tamilnadu, India  
2Department of Physics, Chikkanna Government Arts College, Trippur, Tamilnadu, India  
Email:prabakaran27mar@gmail.com

### Abstract

Tight focusing properties of an radially polarized doughnut Gaussian beam through a dielectric interface is theoretically investigated by vector diffraction theory. For the incident beam with topological charges (m), probe depth (d) and revolve in the vicinity of focal plane, which results in the generation of many novel focal patterns. Such kind of focal structures may find applications in micro-particle trapping, manipulation, and material processing.

**Keywords:** Radially polarized DG beam, Focal shift, Dielectric interface, Vector diffraction theory.

## STRUCTURAL ACTIVITY AND INSILICO ANALYSIS OF BIOCHANIN FLAVONOIDS – A THEORETICAL APPROACH

K.Ajith kumar, M.Rajeswari, K.Anbzhagan.,  
1Department of Physics, Gobi Arts & Science College, Gobichettipalayam.  
2Bannari Amman Institute of Technology, Sathyamangalam.

### Abstract

Secondary metabolites derived from plants, fruits and vegetables plays important role in maintenance and protecting of human health. Being radical scavengers they avenge our body from invading radical species. Flavonoids are of particular interest in secondary metabolites as they sagegaured us against cell ageing, cardiovascular diseases, carcinogenic agents, oxidative stress etc., The structure of the flavonoids determines their superiority in scavenging the free radicals. Hence it is important to study their structural properties in order to explain their scavenging mechanism. Theoretical investigation nowadays provides much useful results similar to experimental one, and they doesn't require human power, waste of resources and time consuming. In the present work two flavonoids (Biochanin A and Biochanin B) of same parental connectivity are been considered for theoretical investigation of the structural activity and their nomination towards the pathogenic targets. Density functional theory – a useful concept derived from quantum mechanics mainly focuses over the electronic density around the molecules is used in the present investigation. The geometry of the two flavonoids are been optimized with the help of Beckes three parameters along with the functions of Lee-Yang and Parr using the triple zeta valence basis set 6-311G(d,p). Thermo-chemical calculations (frequency) is carried out under room temperature with 1 atmospheric pressure. In order to understand the occupied orbital levels frontier molecular orbital analysis(FMO) is done and corresponding energy gap Egap between the energy levels is found. Electron donating capability and accepting capability of two flavonoids are been investigated with the help of molecular electrostatic potential (MEP). The results visualized from MEP depicts that the hydroxyl units present in the A-ring is highly active for both compounds. Further insilico analysis was carried out for the compounds to understand the probability to be active and probability to inactive against the disease causing agents.

## GREEN SYNTHESIS AND CHARACTERIZATION OF ZINC OXIDE NANOPARTICLE USING OCIMUM TENUIFLORUM LEAVES

E.Maheshwari, V.Kalaiselvi  
Department of physics, Navarasam arts and Science College for Women, Erode  
Email: nk.arthi.kalai@gmail.com

#### Abstract

Nanomaterial is defined as a "material with any external dimension in the nanoscale or having internal structure or surface structure in the nanoscale", with nanoscale defined as the "length range approximately from 1 nm to 100 nm". Plant-mediated nanoparticle is a green chemistry approach that connects nanotechnology with plants. Zinc oxide is commonly found in medical ointments where it used to treat skin irritations. In the present study ZnO nanoparticles were successfully prepared by using green synthesis method with *Ocimum tenuiflorum* extract. The synthesized sample characterized by X-ray Diffraction (XRD), Scanning electron microscope (SEM), Electron dispersive X-ray analysis (EDAX), Fourier transform infrared spectroscopy (FTIR) and Antibacterial activity. The results of antimicrobial activities revealed that high zones of inhibition was observed in Gram positive bacteria (*Staphylococcus aureus*) than Gram negative bacteria (*Pseudomonas aeruginosa*). The ZnO can be applied with medical field.

**Keywords:** Zinc Oxide nanoparticles, *Ocimum tenuiflorum*, FTIR and EDAX

### INVESTIGATIONS OF HYDROGEN BONDED LIQUID CRYSTAL BINARY MIXTURES

R.Viswanathana, G. Chandrasekara, N. Pongali Sathya Prabu  
Department of Physics, Gobi Arts & Science College, Gobichettipalayam  
Bannari Amman Institute of Technology, Sathyamangalam

#### Abstract

Double hydrogen bonded liquid crystals formed between Methyl Malonic acid (MM) and p-n-alkyloxy benzoic acids (nBAO) are characterized. Variation in the molar proportion of MM+nBAO (n= 7 and 10) exhibiting good phase polymorphism yields two different set of binary mixtures labeled as X and Y (where X=MM+7BAO and Y=MM+10BAO) which yields four hydrogen bonded binary mixtures as the result. The molar proportions of X and Y are varied in steps of 0.6 to 0.9 to obtain eighteen binary mixtures. Chemical, optical and thermal analysis is carried out for all the four binary mixtures formed. Hydrogen bond existence and the chemical environment of the precursor are confirmed by Fourier Transform Infrared Spectroscopy (FTIR) and Nuclear Magnetic Resonance Spectroscopy (NMR) studies respectively. Phase variance and the corresponding transition temperatures of the binary mixtures are studied by the observation of textures through Polarizing Optical Microscope (POM) and the same is verified by recording the Differential Scanning Calorimetry (DSC). Phase diagram of the two binary mixtures is built from the POM and DSC data. Thermal equilibrium, Odd-even effect, thermal stability factor, order of phase transition, stability of phase through enthalpy values and specific heat value possessed by the mixtures are derived from the DSC datum obtained. These investigations are performed for the prepared binary mixtures with a curiosity to understand the optical and calorimetric properties exhibited by them.

### NUMERICAL SIMULATION ON THE PERFORMANCE OF SPR BASED FIBER OPTIC SENSOR USING NANOCOMPOSITES

T.Abiramavalli<sup>1</sup>, K.Kaviyarasi<sup>1</sup>, S. Subanya<sup>1</sup>, K.B. Rajesh\*  
<sup>1</sup>Department of physics, PSGR Krishnammal College for Women, Coimbatore-641 004.  
<sup>2</sup>Department of physics, Chikkanna Government Arts College, Tiruppur - 641 602.  
\*Email: rajeshkb@gmail.com

#### Abstract

In the last few decades, Surface Plasmon Resonance technique has become highly influential for its chemical, bio-chemical and gas sensing applications due to its compactness, flexibility and reliability. Transparent conducting oxide like  $\text{In}_2\text{O}_3$  are of immense interest due to their good electrical conductivity property and high transparency in the visible and infra red region. A study on the performance of spr based fiber optic sensor with nanocomposites has been carried out numerically and investigated. Nanocomposites comprising of Co and Ni nanoparticles with their varying volume fractions embedded in the host dielectric matrices of Indium Oxide are considered for the study. The metal nanoparticles exhibit tremendous optical properties originating from the surface plasmons and hence show better sensing performance than materials in the macro or large scales. By varying the thickness of the nanocomposite for various volume fractions, the performance parameters such as FWHM, sensitivity and Q-factor of the sensor were studied and analyzed. The sensitivity of Ni/ $\text{In}_2\text{O}_3$  nanocomposites based sensor shows better performance for all thicknesses with any volume fraction compared to Co/ $\text{In}_2\text{O}_3$  nanocomposites. It is observed that the sensitivity of the sensor increases with increase in both thickness of the nanocomposites and the volume fraction of metal nanoparticles. The usage of Co and Ni in the place of noble metals has curtailed the cost of the spr sensor.

**Keywords:** fiber optic sensors, surface Plasmon resonance, nanocomposites, Full width half maxima (FWHM).

### COPPER NANOPARTICLES WITH SPONGY STRUCTURE

R.Revathi, S.Thilagavathi.  
Department of Physics, Gobi Arts and Science College, Gobi, Tamil Nadu, India.

#### Abstract

Copper oxide nano particles have been prepared by Electro reduction method process using plating bath containing homogeneously acidified copper sulphate solution. The nano particles are formed as spongy layers of ball structures on the plating electrode. The spongy layers of copper can be easily separated to give fine particles. The resulting spongies are characterized by the excellent mechanical properties. Structural characterizations are studied by using XRD, X-ray photo electron spectroscopy and UV. Morphological characterizations are studied by SEM and TEM.

**SYNTHESIS AND CHARACTERIZATION OF PURE AND PB DOPED CDS THIN FILMS**

G. Ramkumar\*, R. Balan and R. Sakthi Sudar Saravanan

Department of physics, Chikkanna Government Arts College, Tiruppur-641602, Tamilnadu, India

\*Email: rkramkumar002@gmail.com,

**Abstract**

Abstract The cutting edge properties of nanomaterials are to the rapidly developing and growing worldwide and for nano and femto scientific/technological devices. The role of compound semiconductors is playing a significant role for the active, optical, electrical, mass storage devices such as LED, LCD and etc. One among the reliable and most efficient method of synthesizing nanophase materials are chemical bath deposition (CBD). Semiconductor material of pure and two different concentration (4 mol % and 8 mol % ) of Pb doped CdS thin films have been prepared on glass substrates by chemical bath deposition (CBD) technique using cadmium acetate dehydrate, lead acetate and thiourea is used as the precursors. Ammonia solution is used to maintain the pH level at 10 in the solution. Film thickness, grain size, crystal structure, surface morphology and optical properties of the as prepared pure and doped films has been studied by XRD, SEM, TEM and UV-Vis. analysis.

**Keywords:** CBD, Semiconductor, CdS, CdS:Pb, XRD, SEM, UV-Vis.

**MPA CAPPED CDS QUANTUM DOT**

Sukitha P., Gobi Arts &amp; Science College, Gobichettipalayam

**Abstract**

Due to the unique optical properties like size tunable emission color, narrow emission peak and high luminescence efficiency semiconductor Quantum dot (QDs) are emerging candidates for various application. Cadmium Sulfide (cds) Quantum dots were synthesized by a reflux condensation method using 3-Mercaptopropionic acid (MPA) as capping agent. The optical properties of the prepared samples are characterized by UV/VIS and PL. The sample exhibit absorption and emission at 400nm and 600nm respectively. Then the preparation of core shell Quantum dot is carried out by taking cds as core and Zns as shell, which brings high efficiency in optical property. Owing to that property, We can use it in the application of solar cells.

**SYNTHESIS AND CHARACTERIZATION OF FeO NANOPARTICLES AND ITS ANTIBACTERIAL ACTIVITY**

M. Vishalatchi, P. Sudha.

Department of physics, Navarasam Arts and Science College for Women, Erode.

Email: sudhainfo123@gmail.com

**Abstract**

In recently, Ferric oxide nanoparticles were synthesized by chemical co-precipitation method. FeO nano particle were synthesised by chemical co precipitation method associated with microwave irradiation method. The prepared Ferric oxide was characterised by XRD, FTIR, SEM, EDAX, UV and Antibacterial Activity. The X-ray diffraction (XRD) pattern analysis reveals crystal structure of FeO. The FTIR pattern represents the functional groups of the prepared sample. The morphology and purity of sample was analysed by using Scanning Electron Microscopy (SEM) and Energy Dispersion X-ray Diffraction (EDAX) analysis. The optical properties carried out by ultra-violet spectroscopy (UV). The Antibacterial activity of the FeO nanoparticles with gram positive (*Bacillus Subtilis*) and gram negative (*Pseudomonas aeruginosa*) bacteria. The results matches well with standard values.

**KEYWORDS:** FeO, Antibacterial activity, EDX, UV-spectrum. **REFERENCE:** 1, F. Fu and Q. Wang, "Removal of heavy metal ions from wastewaters

**QUANTUM DOT SOLAR CELL**

Renugadevi M., Gobi Arts &amp; Science College, Gobichettipalayam

**Abstract**

Semiconductor quantum dots are extremely interesting materials due to their efficient optical properties used for the development of photovoltaic devices. The synthesis of CdS quantum dot is achieved by using CdCl<sub>2</sub> and Na<sub>2</sub>S as precursors which is capped by 3-Mercaptopropionic acid. The preparation technique employed here is Reflux Condensation Method. To know the optical properties, the sample is characterized by using UV-Vis absorption and Photoluminescence spectroscopy. The sample exhibit the absorption and emission at 400 nm and 600 nm respectively. CdS QD deposited in the pores of TiO<sub>2</sub> nanotube array may significantly increase the photocurrent thereby resulting in the efficient usage of solar cell application.

**A REVIEW OF NANOSTRUCTURED MG DOPED ZNO THIN FILMS USING CHEMICAL BATH DEPOSITION METHOD**

N. Deepa, V. Senthil kumar\*

Department of Physics, Chikkanna Government Arts College, Tiruppur, Tamilnadu, India.

\*Email: kalasen2009@gmail.com

**Abstract**

Zinc oxide (ZnO) nanoparticles provide large band gap and high excitation binding energy which is usually assigned with the production and usage of materials with nanoscale dimensions. This material is a promising material with unique structure and size dependent electrical, optical and mechanical properties thus having potential applications in multifarious areas like optoelectronics, sensors, transducers and pharmaceuticals to even agriculture. Of the various methods that have been employed for film deposition, chemical bath deposition method is the one that is widely used for its simplicity and affordability. The present paper critically provides a review of Mg doped ZnO thin films deposited with different concentration of dopants from 2016-2018. The experimental studies and the results obtained are reviewed.

**Keywords:** Zinc oxide thin film, Magnesium, chemical bath deposition, applications.

### GREEN SYNTHESIS OF ZINC OXIDE NANOPARTICLES BY USING HIBISCUS ROSA-SINENSIS

S.Nandhini, N.Vidhiya

Department of physics, Navarasam arts and science college for women, Erode.

Email: vidhiyasivam3@gmail.com

#### Abstract

Nanotechnology is defined as the study and use of structures between 1 nanometer to 100 nanometers in size. Zinc oxide is an inorganic compound with the formula ZnO applied in the anticancer and antibacterial field. The present study is focus on green chemistry in the synthesis of Zinc Oxide nanoparticles using Zinc acetate dehydrate and utilizing the bio components of leaves extract of Hibiscus rosa-sinensis. ZnO nanoparticles were successfully prepared by chemical precipitation method. The synthesised sample was characterized by XRD, FTIR, SEM, EDAX and Antibacterial activity. XRD analysis revealed the hexagonal structure of ZnO nanoparticles. FTIR pattern represents the functional groups of the prepared sample. SEM and EDAX reveal the purity and morphological structure of the sample. The bacterial action checked by using gram positive staphylococcus aureus and gram negative pseudomonas. The results are well matched with standard values. The ZnO can be applied with antibacterial field.

**Keywords:** Zinc oxide, green synthesis, antibacterial activity and Hibiscus rosa-sinensis.

### SYNTHESIS OF CuO-SiO<sub>2</sub> CORE-SHELL NANOPARTICLES

S.Monika, S.Thilagavathi

Department of Physics, Gobi Arts and Science College, Gobichettipalayam, Tamilnadu, India.

#### Abstract

Copper oxide nano particles exhibits intense and sharp Localized Surface Plasmon Resonance [LSPR] in visible region. However the LSPR peaks become weak and broad due to the oxidation Of Cu. In this work Cu nanoparticles are encapsulated in SiO<sub>2</sub> with TOP capping of the oxidation Of Cu cores in micro emulsion was reduced. For a mixture of nanocubes and nanorods, the spectra Evolved to two distinct peaks. These Cu-SiO<sub>2</sub> core-shell nanoparticles with sharp and stable LSPR May greatly expand the utilization of Cu nanoparticles in aqueous environments.

### AN INVESTIGATION OF ENERGY HARVESTING FROM PZT AND PVDF COMPOSITES

S.Sathiyapriya, T.Ramya, V.Annamalai\*

Department of Physics, Chikkanna Government Arts College, Tiruppur, TN, India

Email:annamalai\_140795@yahoo.co

#### Abstract

Piezoelectric materials have been in use for many years. Piezoelectricity has gained significant importance in research and development for extracting energy from the environment. In this work, the voltage responses of ceramic based composite structures and polymer based piezoelectric materials were evaluated when subjected to various pressures. This kind of subjected pressures leads to investigate the possibility of energy generation.

**Keywords :** piezoelectricity, ceramics, polymers, energy generation.

### MODELING AND SIMULATION OF A 150MHZ ST-X QUARTZ SAW DELAY LINE DEVICE BY EQUIVALENT CIRCUIT MODEL FOR POTENTIAL SENSOR APPLICATIONS

Mohanapriya V, Banu Priya R

Department of Physics, Gobi Arts and Science College, Gobi, Tamilnadu-638453.

Email: rithubanu@gmail.com

#### Abstract

Surface Acoustic Wave is an acoustic wave traveling along the surface of a material exhibiting elasticity, with amplitude that typically decays with the depth into the substrate. This paper presents the frequency response of a 150 MHz ST-X Quartz SAW delay line device fabricated with uniform IDTs. SAW device design parameters like piezoelectric substrate, structure of IDT, number of finger pairs, device frequency and etc., are optimized and its frequency response studied based on the Equivalent Circuit Model via a unique custom made MATLAB algorithm. The results obtained are analyzed to ultimately help in the effective design, development and modelling of such devices for potential applications in specific sensors. **Keywords:** Surface Acoustic Wave, Interdigital Transducer, Equivalent Circuit Model

## SYNTHESIS AND CHARACTERIZATION OF ZnO NANOPARTICLES AND ITS ANTIBACTERIAL ACTIVITY

N.Iswarya, P. Sudha

Department of physics, Navarasam Arts and Science College for Women, Erode

Email: sudhainfo123@gmail.com

### Abstract

In the present work, zinc oxide nanoparticles were synthesized using chemical co-precipitation method. ZnO nano particle were synthesised by chemical co precipitation method associated with microwave irradiation method. The prepared zinc oxide was characterised by XRD, FTIR, SEM, EDAX, UV and Antibacterial activity. The X-ray diffraction (XRD) pattern analysis reveals the crystal structure of zinc. The FTIR pattern represents the functional groups in the prepared sample. The morphology and purity of sample was analysed by using Scanning Electron Microscopy (SEM) and Energy Dispersion X-ray Diffraction (EDAX) analysis. The optical properties carried out by ultra-violet spectroscopy (UV). The Antibacterial activity of the ZnO nanoparticles was performed with gram positive (Staphylococcus Aureus) and gram negative (Escherichia coli) bacteria. The results matches well with standard values.

**KEYWORDS:** ZnO, Antibacterial activities, EDX, UV-spectrum.

## SYNTHESIS AND CHARACTERIZATION OF RICE STARCH :POLY VINYL ALCOHOL:LiCl BIODEGRADABLE GEL POLYMER ELECTROLYTE

Sree Aarthy.S, Udhayakumar.E

Department of Physics, Gobi Arts and Science College, Gobi, Tamilnadu-638453.

Email: udhaya14591@gmail.com

### Abstract

Starch is the most abundant and in expensive biopolymer. PVA is a water soluble synthetic polymer which forms copolymers of vinyl alcohol and vinyl acetate. A blend composing PVA and rice starch along with LiCl with varied weight percentage was prepared using solution casting technique. The prepared biopolymer membranes are analyzed for their crystallinity, i.e they are doped with crystalline LiCl. Increase in crystalline nature restricts ionic moment inside the membrane hence it is necessary for them to exhibit amorphous nature which favors conductivity. Incorporation of lithium ions inside the polymer chain will be examined with the help of vibrational assignment observed from Fourier Transform Infrared Spectrograph. After this the synthesized gel polymer electrolytes will be taken for AC impedance analysis to find the dielectric behaviour and conductivity. Based on the observations from morphological, vibrational and electrical characterizations, the results will be finalized.

## SYNTHESIS AND CHARACTERIZATION OF Ni<sub>0.5</sub>Cd<sub>0.5</sub>O NANOPARTICLES BY CHEMICAL PRECIPITATION METHOD

N. Mathipriya,R. Sakthi Sudar Saravanan\*

Department of Physics, Chikkanna Government Arts College, Tiruppur – 641602, Tamilnadu, India

\*Email: mathipriya50@gmail.com

### Abstract

Ni<sub>0.5</sub>Cd<sub>0.5</sub>O nanoparticles (NPs) have been successfully prepared by chemical precipitate technique under microwave irradiation condition. The as-synthesized nanoparticles were characterized by X ray diffraction (XRD) to study the crystal structure. The crystallite size computed using Scherrer's formula was found to be in the nano range. The morphology and the stoichiometric ratio of the nanoparticles were characterized by scanning electron microscopy (SEM) and energy dispersive X-ray analysis (EDX). The band gap of the as-synthesized Ni<sub>0.5</sub>Cd<sub>0.5</sub>O nanoparticles was determined by UV-Vis absorption spectra measurement. All the results will be presented and discussed.

**Keywords:** Ni<sub>0.5</sub>Cd<sub>0.5</sub>O nanoparticles; semiconductor; XRD; UV-Vis; Bandgap.

## INVESTIGATION OF IRON OXIDE NANOPARTICLES USING FICUS CARICA DRIED FRUITS AND ANTI BACTERIAL ACTIVITY

P.K.Sum, K.Surya

Department of physics, Navarasam arts and science collage for women, Erode

Email: suryaaprabhu26@gmail.com

### Abstract

In Recent years the green synthesis of nano particles involving plant extract has attracted the attention of researchers. In this work we followed green method for the synthesis of iron oxide nano particles using fruits extract of Ficus carica. Reduction of metal ions through fruits extracts leading to the formation of iron oxide nano particles. The formation of iron oxide nanoparticle has been characterized by Fourier Transform Infrared Spectroscopy (FTIR), X-Ray diffraction(XRD) ).The qualitative and quantitative component of the iron oxide NPs analyzed using Energy Dispersive X-Ray Microscopy(EDS) and further invitro analysis was performed using gram positive staphylococcus aureus and gram negative Escherichia coli. The surface morphology of iron oxide nanoparticle where obtained from Scanning Electron Microscope (SEM) image. Invitro analysis predicts the significant zone of inhibition for both the bacteria. Novelty of this present study is that the plant extract is very cost effective and eco friendly and thus can be economic and effective alternative for the large scale synthesis of iron nanoparticles.

**Keywords:** Ficus carica dried fruit, invitro, FTIR, EDS.

**HYDROGEN BONDED LIQUID CRYSTALS: BINARY MIXTURES**

S.Manimekalai<sup>a</sup>, G. Chandrasekar<sup>a</sup>, N. Pongali Sathya Prabu<sup>b</sup>  
<sup>a</sup>Department of Physics, Gobi Arts & Science College, Gobichettipalayam  
<sup>b</sup>Bannari Amman Institute of Technology, Sathyamangalam

**Abstract**

Thermotropic double hydrogen bonded liquid crystals comprising of Methyl Malonic acid (MM) and p-n-alkyloxy benzoic acids (nBAO, n=7 and 9) have been prepared and investigated in the present study. It comprises of nematic, smectic C and smectic G mesogenic phases. Complexes consisting of smectic B phase swap away smectic C phase and absence of smectic G phase have been chosen for the preparation of binary mixtures whose molar ratio varies from 0.6 to 0.9. The optical and thermal properties of the prepared binary mixtures have been investigated. Four binary mixtures are formed as a result of different molar proportions between the chemical components. These binary mixtures are further characterized by Fourier Transform Infra-red spectroscopy (FTIR) for confirmation of hydrogen bond existence. Polarizing Optical Microscope (POM) and Differential Scanning Calorimetric (DSC) thermograms are recorded for textural observation and individual phase transition temperature correlation for individual mesogenic phases respectively. Phase diagrams have been constructed from the POM and DSC data. Thermal studies such as specific heat analysis, thermal stability factor, odd-even effect, order of phase transition are extracted from the DSC thermogram data.

**GREEN SYNTHESIS OF CADMIUM NANOPARTICLES FROM HIBISCUS SABDARIFFA FLOWER EXTRACT**

Priyadharsini.N, Gayathiri.S\*  
 Department of Physics, P. K. R. Arts College for Women, Gobi.  
 Email: gayathiri1992@gmail.com

**Abstract**

The synthesis of CdO nano-crystals by green chemistry process based on Hibiscus Sabdariffa flower extract and their main physical properties are reported. While it is shown that the natural extract acts as an effective chelating agent in facilitating the formation of the CdO nano particles. Hibiscus petals of about 25gm was taken along with 100ml of distilled water and heated at 100°C to obtain the aqueous solution and 0.1 M Cadmium Chloride solution was mixed with it at 80°C. Finally the Cadmium nano particles were formed. The compositional and optical analyses are taken and studied.

**Keywords:** Compositional, optical, aqueous solution, nano particles

**IMPULSE MODELLED RESPONSE OF A 150MHZ ST-X QUARTZ SAW DELAY LINE DEVICE FOR SENSOR SPECIFIC APPLICATIONS**

Kowsalya.S, Banu Priya R  
 Department of Physics, Gobi Arts and Science College, Gobi, Tamilnadu-638453.  
 Email: rithubanu@gmail.com

**Abstract**

Surface Acoustic Wave is an acoustic wave traveling along the surface of a material exhibiting elasticity, with amplitude that typically decays with the depth into the substrate. This paper presents the frequency response of a 150 MHz ST-X Quartz SAW delay line device fabricated with uniform IDTs. SAW device design parameters like piezoelectric substrate, structure of IDT, number of finger pairs, device frequency and etc., are optimized and its frequency response studied based on the Impulse response Model via a unique custom made MATLAB algorithm. The results obtained are analyzed to ultimately help in the effective design, development and modelling of such devices for potential applications in specific sensors. **Keywords:** Surface Acoustic Wave, Interdigital Transducer, Impulse Response Model

**SYNTHESIS OF CUO SURFACTANT NANO PARTICLES**

J.Parkavi, S. Thilagavathi  
 PG and Research department of physics, Gobi Arts and Science college, Gobichettipalayam , Tamil Nadu

**Abstract**

Copper oxide nano materials were successfully synthesized by the chemical method by varying the solvents, surfactants and temperature. The effects of the solvents surfactants and temperature on the structural, morphological and optical properties of the cuo nanomaterials were studied by powder XRD, FTIR, SEM, TEM, UV and PL analysis. The structure of CuO nano materials were confirmed by the XRD analysis. The band gap energy of the CuO nano particles were calculated from the UV-visible absorption spectra.

## MODEST SOL-GEL CHEMICAL SYNTHESIS OF CU - METAL ORGANIC FRAMEWORKS FOR MULTIPURPOSE APPLICATIONS

M. Mercilin Divya, G. Sahaya Dennish Babu\*, R. Sivamurugan

Department of Computer Science and Engineering,

Department of Physics, Chettinad College of Engineering and Technology, Puliur-CF, Karur

\*Email:dennishbabu@hotmail.com

### Abstract

Recently, the development of clean sustainable energy storage and conversion technologies to deal with environmental pollution and the forthcoming energy crisis has concerned much consideration in the energy research community. It is critical to develop carriers to stockpile energy or to enable mass and electron transportation in energy storage and conversion. The emerging metal-organic frameworks (MOFs) are well suited for this purpose because of their characteristic compensations, including structural diversity, functionality, tailorability, and versatile applications. Moreover, when utilized as supports and sacrificial precursors, MOFs can immobilize active functional materials and create highly controllable nanostructures, respectively, gaining new momentum for energy applications. In this aspect, we have been made an attempt to synthesize Cu-BTC MOFs through a simple sol-gel chemical method. The prepared MOF was characterized by various physical, chemical techniques. The details will be presented.

**Keywords:** Metal Organic Frameworks, Energy Storage, Battery, Supercapacitors

## TURNING CARBON DIOXIDE TO ELECTRICITY FOR FUTURE USAGE

T.MANOJKUMAR V.ANNAMALAI\*

Department of physics, chikkanna government arts college, tiruppur

### Abstract

Carbondioxide is present almost all of the Earth and major reason for global warming. This gas will make our earth into a non-livable place. Some methods are there about how to reduce the carbondioxide and how to use the carbondioxide in various ways. Likewise we may able to produce electricity by electrochemical cell with porous carbon and aluminum electrodes. This method is used for carbondioxide atmosphere like Mars which have 96 percent of it's atmosphere is carbondioxide and future usage for humans due to the cost of the method is low.

## SYNTHESIS OF ZINC STANNATE (ZNSNO<sub>3</sub>) PEROVSKITE NANOMATERIALS FOR SOLAR CELL APPLICATIONS

M. Solai Dhayanithi, G. Sahaya Dennish Babu\*

Department of Electrical and Electronics Engineering,

Department of Physics, Chettinad College of Engineering and Technology, Puliur-CF, Karur, Tamil Nadu

\*Email: dennishbabu@hotmail.com

### Abstract

Metal oxide semiconductors have multiple functions and promising application in optical and electrical fields due to their excellent impressive electronic and optical properties. So they have gained much importance in recent years. In this regard, a simplistic and inexpensive hydrothermal method was used to synthesize ZnSnO<sub>3</sub> nanoparticles with perovskite structure. The crystallography and optical properties of the as-synthesized ZnSnO<sub>3</sub> nanoparticles were studied using X-ray diffraction (XRD) and UV-visible spectroscopy (UV-Vis). The morphology of the nanoparticles was observed using field emission scanning electron microscopy (FESEM). Typical electron microscopic investigations of SEM and TEM were used to study the morphology and the particle size. The formation of ZnSnO<sub>3</sub> nanoparticles and their particle size were confirmed by the TEM analysis. The optoelectronic property of the prepared ZnSnO<sub>3</sub> suggests that this material can play vital role in perovskite solar cells as low-cost alternative hole-transporting material applications. Details will be presented.

**Keywords:** ZnSnO<sub>3</sub>, Perovskites, Solar Cells, Hole-Transporting Materials

## RING LASER GYROSCOPE

C.Akila,V.Annamalai\*

Department of Physics, Chikkanna government Arts College, Tirupur, TN, India.

\*Email: annamalai\_140795@yahoo.co.in

### Abstract

A certain rate of rotation of light induces a small difference between the time, which takes light to traverse in the opposite direction. This Sagnac effect introduces a tiny separation between the frequencies used in ring laser gyroscope. It is mainly used in inertial navigation system and established high accuracy. The application of it are airbus, boeing and anti-satellite missile. The theory of Sagnac effect various applications of ring laser gyroscope were discussed.

## PREPARATION AND CHARACTERIZATION OF MoO<sub>3</sub> THIN FILMS BY SPRAY PYROLYSIS TECHNIQUE

B.Karthi,, G.Umadevi,

Department of Physics Government Arts college, Coimbatore

**Abstract**

Using the spray pyrolysis technique,  $\text{MoO}_3$  thin films were deposited on quartz substrates. Precursors were different concentrations of Ammonium molybdate hepta tetrahydrate  $(\text{NH}_4)_6\text{Mo}_7\text{O}_{24}\cdot 4\text{H}_2\text{O}$ . These were dissolved in 25ml distilled water and was homogeneously stirred for half an hour. Air was injected at the constant pressure of  $2.2\text{Kg}/\text{cm}^2$  to pulverize solution. The substrate was kept maintained at  $4000^\circ\text{C}$ . The solution was filled in the nozzle. The optimal value of 13cm was fixed at the nozzle to substrate plane distance. The uniformity of deposited thin films was ensured by optimizing the horizontal sweep of the nozzle. A constant precursors flow rate was maintained and 20 seconds fixed as deposition time. After deposition, the coated substrates were allowed to cool down naturally to room temperature. Optical studies of the sample provided the information about refractive index, excitation coefficients, absorption coefficients, dielectric constant of thin film, Band gap energy and dissipation factor. The results were found to be in agreement with the previous studies.

**Keywords:**  $\text{MoO}_3$ , concentrations, spray pyrolysis, optical studies

**LOW COST, NON-TOXIC, EARTH-ABUNDANT  $\text{Cu}_2\text{ZnSnS}_4$  AND  $\text{Cu}_2\text{NiSnS}_4$  COUNTER ELECTRODES FOR DYE SENSITIZED SOLAR CELLS APPLICATIONS**

M. Havena, S. Haripriya, G. Sahaya Dennish Babub\*

Department of Electronics and Communication Engineering,

Department of Physics, Chettinad College of Engineering and Technology, Karur .

\*Email: dennishbabu@chettinadtech.ac.in

**Abstract**

We report the synthesis of  $\text{Cu}_2\text{ZnSnS}_4$  (CZTS) and  $\text{Cu}_2\text{NiSnS}_4$  (CNTS) nanostructures by novel hydrothermal method at  $200^\circ\text{C}$  for 24 h in a proportional integral derivative controlled oven. X-ray diffraction reveals the synthesized nanostructures were present in kesterite structure, which is predominant for solar cells applications. The crystallite sizes were around 20-30 nm calculated by Debye-Scherrer formula. Field-emission scanning electron microscopy (FESEM) and Transmission electron microscopy (TEM) show the morphological features of nanostructures. Selected area diffraction (SAED) and Fast - Fourier transform (FFT) pattern analysis confirms growth orientation of nanostructures and perfectly matched with XRD pattern. X-ray photoelectron spectroscopy advocates the oxidation states of elements presented in the prepared material. Preliminary studies show the potential use of these CZTS and CNTS materials as efficient, low cost, non-toxic counter electrodes for DSSC applications [1,2]. Details will be presented.

**Reference:**

1. Y-F. Du, J-Q. Fan, W-H. Zhou, Z-J Zhou, J. Jiao, S-X. Wu, ACS Appl. Mater. Interfaces, 2012, 4, 1796–1802
2. S. Chen, A. Xu, J. Tao, H. Tao, Y. Shen, L. Zhu, J. Jiang, T. Wang, ACS Sustainable Chem. Eng. 2015, 3, 2652–2659

**COSMOLOGY AND BLACK HOLES EXPLANATION**

R.BALAN L.JAYAPARVATHI G.JEEVA

Department of physics, Chikkanna government arts college, Tiruppur

**Abstract**

Cosmology is one of the branch of science to understanding about our universe and the origin and formation of universe. From the big bang till now we saw many objects and many inventions were made like Neutron star, Hot neptunes, and a main one black hole. Black hole is a object that was made by a dense star which was the final stage of the star and many conspiracy theories are there about black holes. Nowadays, black holes are considered as an important object in our universe due to many mysteries and many researches are going on. The term black hole was coined by John wheeler an American physicist at 1967.

**SIMPLE CHEMICAL SYNTHESIS AND CHARACTERIZATION OF METHYLAMMONIUM LEAD IODIDE-BROMIDE ( $\text{CH}_3\text{NH}_3\text{PBBR}_3$  &  $\text{CH}_3\text{NH}_3\text{PB(IBR)}_3$ ) NANOMATERIALS FOR PEROVSKITE SOLAR CELL APPLICATIONS**

M. Kiruthika, G. Sahaya Dennish Babu\*, Farshid Pahlevani, Veena Sahajwalla

Department of Electronics and Communication Engineering,

Department of Physics, Chettinad College of Engineering and Technology, Puliur, Karur , Tamil Nadu, India,

Sustainable Materials Research and Technology (SMaRT), UNSW, Australia

\*Email: dennishbabu@chettinadtech.ac.in

**Abstract**

Hybrid organic-inorganic perovskite materials have been considered as a potential material for the next generation photovoltaic and optoelectronic applications. Recently, perovskite solar cells based on methyl ammonium lead iodide perovskite thin film solar cell has achieved 22 % of power conversion efficiency in very short span of time. It shows significant development on solar cells industries to replace the high cost silicon solar cells. In this concern, we have been made an attempt to synthesize methyl ammonium lead bromide and methylammonium lead bromo-iodide nanomaterials using simple chemical method using low-cost precursor materials. From the powder XRD results, the prepared perovskite materials shows perfect crystalline nature and their crystallite sizes varies from 15-20 nm. Rods- like and fine spherical shape nanostructures and its elemental distributions have achieved by scanning electron microscope and EDS analysis. Phase purity of the perovskite nanomaterials have been confirmed by Raman spectroscopic analysis. Our results indicate that the prepared nanomaterials have ability to use as photo-absorbing material in perovskite solar cell applications. Details will be presented.

**Keywords :** Perovskites, Solar Cells, Chemical Method, Low-cost Materials

**LEUCINE DOPED WITH POTASSIUM DI-HYDROGEN PHOSPHATE**

A.MAHESWARI, V.ANNAMALAI\*

Department of physics, Chikkanna Government Arts College, Tiruppur

**Abstract**

Potassium Di-Hydrogen Phosphate(KDP) is one of the most popular crystals used for nonlinear optical (NLO) applications. KDP crystals attract more interest because of their unique nonlinear optical dielectric and anti-ferroelectric properties. The L-Leucine doped KDP(LLKDP) single crystals were grown by slow evaporation method at room temperature. The crystalline nature of the grown LLKDP crystal is studied by single crystal analysis. A Fourier transform infrared (FT-IR) study confirms the functional groups of the crystals. The second harmonic generation efficiency of the crystals was determined by NLO studies. The UV-visible study confirms the wide optical transmittance window for the doped crystals imperative for optoelectronics applications. The electrical properties of the grown crystal have been analysed by dielectric constant and dielectric loss of frequency.

**HYDROTHERMAL SYNTHESIS OF P-TYPE  $\text{Cu}_2\text{FeSnS}_4$  NANOPARTICLES FROM METAL-DIETHYLDITHIOCARBAMATE PRECURSORS FOR SOLAR CELL APPLICATIONS**

R. Jaishika, G. Sahaya Dennish Babu\*, X. Sahaya Shajan, Shivani Dhall, Mengistie L. Debasu

Department of Civil Engineering,

Department of Physics, Chettinad College of Engineering and Technology, Karur ,

Centre for Scientific and Applied Research (C-SAR), PSN College of Engineering and Technology, Tirunelveli,

Department of Physics, Indian Institute of Technology, Delhi -110016 , eDepartment of Materials Science, Universidad de Aveiro, Portugal

\*E-Mail – dennishbabu@chettinadtech.ac.in

**Abstract**

Copper iron tin sulfide,  $\text{Cu}_2\text{FeSnS}_4$  (CFTS) is a quaternary chalcogenide semiconducting nanomaterial which is considered as one of the promising next-generation materials for low-cost thin-film solar cells applications. In the present study, hydrothermal method was employed to synthesized CFTS nanoparticles using metal – diethyldithiocarbamate as a new precursor material. By this approach, unique nanostructure with interesting properties can be obtained. The effect of organic diethyldithiocarbamate on structural, chemical, optical and electrical properties of CFTS nanoparticles were clearly investigated via various analytical techniques. Quaternary stannite crystal structure phases of CFTS with crystallite size of 15-20 nm were obtained. Raman spectroscopy results are well agreed with XRD. The electron micrographs illustrate the porous triangle shape and spherical shape morphology of CFTS nanoparticles. The crystallographic feature of CFTS nanoparticles was analyzed by high-resolution electron microscope and chemical nature of constituent elements were analyzed by photoelectron spectroscopy. The UV-Vis absorption spectra revealed strong absorption in visible and near IR region with an optical band gap of 1.35 eV, which is suitable for photovoltaic applications. Details will be presented.

**Keywords**  $\text{Cu}_2\text{FeSnS}_4$ , Stannite, TEM, XPS, TFSC**AN OPTIMAL PATTERN AND APPLICATIONS OF NANO TECHNOLOGY IN MEDICAL DIAGNOSIS**

C. KALAISELVI

Department of Computer Applications, Tiruppur Kumaran College for Women, Tiruppur, Tamilnadu

**Abstract**

Nano technology is an emerging new field because of its wide applications in various fields and least cost. It has a remarkable feature to be used in environmental and physical phenomenon such as medical and life sciences, Materials & Chemistry, Electronics & ICT, Energy. In this paper, we discussed various aspects of nano-technology and its applications in variety of real world applications. Nano technology will enable incremental innovation in some areas, while leading to disruptive innovation in others. Nano technology plays one of the most important research areas and introduced unique challenges compared to traditional applications. The main aim behind this paper is that importance of nano technology in medical & life sciences. It can be used in medical diagnosis in bio laboratories in chip based sensor utilization. The protocol design is to keep the sensors in the medical applications like drug delivery, filters for water and food treatment, Chemical applications in the medical treatment. Although many protocols and regulations have been proposed for nano technology to resolve many issues like Enormous potential and huge gaps in knowledge concerning the possible and potential risks, Persistence - Longevity of particles in the environment and body, difficulty in detecting without sophisticated equipments, difficulty in detecting and removing because of its Small size may result in particles passing into the body more easily through inhalation, ingestion and absorption still remain to be addressed by proper regulations.

**Keywords:** Medical and Life Sciences, Chip Based Sensors, Applications, Regulations, Equipments, Risks



GET THE BEST  
FIT & FINISH

**Polo**



**Crew&V**



**Men**



**Athleisure**

**Women**



**STEENBOK**

**A Majestic Exports Venture**

9 & 10, Malligai Nagar, College Road,  
Tiruppur, Tamil Nadu - 641602

**Best Complement From**

available

@



**amazon**



**WWW.STEENBOK.IN**