



CHEMFLASH



THE CHEMISTRY DEPARTMENT NEWSLETTER

EASWARI ENGINEERING COLLEGE (AUTONOMOUS)

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MESSAGE FROM THE DEPARTMENT HEAD

The Department of Chemistry has been functioning, since the inception of the college in the year 1996. Our vision is to build foundation for excellence and spur development of the Institution as a premier Institution, by igniting and nurturing enthusiasm, interests and passion, in the study of chemistry, in professional courses, as a part of curricula. Our major mission is to awaken the young minds and discover their talents both in theory and in practical chemistry, through dedication to teaching, commitment to students and innovative instructional methods. Our department faculties and staffs are working on our vision and mission. The outcomes of our work are released in, **ChemFlash**, quarterly newsletter of chemistry department. It highlights the department's activities, and faculty's research, award/honors, outreach activities, and achievements. It also focuses on recent happenings/findings in the field of chemistry. Hence, this newsletter is sure to motivate all the budding engineers. I express my heartiest congratulations to all the faculty and staff members in our department.

Dr. C. Ravichandran
HOD/Chemistry

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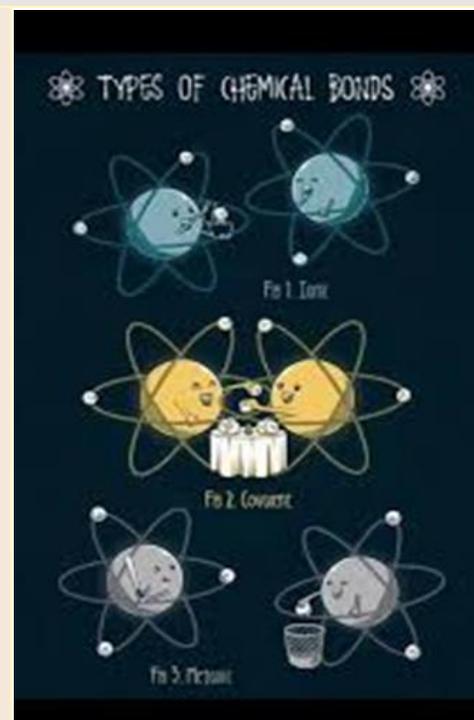


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★★★★★★★★★★

Two Doctoral Students Completed their Viva-Voce Examination

★★★★★★★★★★

Ms. R. Anithadevi



Mrs. Anitha Devi - Ph.D., Viva-Voce Examination

Ms. R. Anithadevi, Assistant Professor, Department of Chemistry, Easwari Engineering College has completed Ph.D. Viva-voce examination on 16th September 2019, who has done Ph.D., work under (Part-time) the guidance of Prof. C. Ravichandran, Department Head/Chemistry, EEC. The title of the Ph.D., thesis is '*Synthesis and characterization of undoped ZnO and Zn_{1-x-y}Mg_xTi_yO₂ nanocomposites and their potential applications*'. Ms. R. Anithadevi was successfully completed Ph.D., presentation and subsequently recommended for Ph.D., award by the examiners.



Mr. S. Mohandoss

Mr. S. Mohandoss, who has done Ph.D., work under the guidance of Prof. B. Venkatachalapathy, Professor, Department of Chemistry, Easwari Engineering College, has completed his Ph.D. Viva-voce examination on 3rd September 2019. The title of his Ph.D., thesis is '*Nano yttria stabilized zirconia coatings on 316L SS by electrophoretic deposition along with chitosan for dental applications*'. Mr. S. Mohandoss was successfully

completed Ph.D., presentation and subsequently recommended for Ph.D., award by the examiners.

Impact of Nanoparticles in Environment

Engineered nanoparticles are widely used in many products due to their unique physical and chemical properties. They are largely discharged into environment. They may affect the environment. However, recent reports reveal that bacteria rapidly become resistant to these nanoparticles. Much less studied is the chronic exposure of bacteria to particles that were not designed to interact with microorganisms. For example, lithium intercalated battery cathode nanosheet, nickel manganese cobalt oxide, is cytotoxic and causes a significant delay in growth of *Shewanella oneidensis* MR-1 upon acute exposure. But, now researchers find that *S. oneidensis* MR-1 rapidly adapts to chronic nickel manganese cobalt oxide exposure and is subsequently able to survive in much higher concentrations of these particles. It provides the first evidence of permanent bacterial resistance following exposure to nanoparticles.

Reference

Chronic exposure to complex metal oxide nanoparticles elicits rapid resistance in *Shewanella oneidensis* MR-1. *Chemical Science*, 2019; DOI: 10.1039/C9SC01942A

Chameleon inspires 'smart skin'

A chameleon can alter the color of its skin. Hence, it either blends into the background to hide or stands out to defend its territory. This color change is possible due the photonic crystals in its skin. Scientists have now prepared a photonic crystal containing iron oxide that changes color in response to the environment, without changing in size.

Reference

Chameleon-Inspired Strain-Accommodating Smart Skin. *ACS Nano*, 2019; DOI: 10.1021/acsnano.9b04231

Nano-guitar string

Scientists have created a nano-electronic circuit which vibrates without any external force. Like a guitar string, the nanowire 100,000 times thinner than a guitar string -- vibrates when forced into motion by an oscillating voltage. Under the right conditions, the wire oscillated of its own accord. The nano-guitar string was playing itself.

Reference

A coherent nanomechanical oscillator driven by single-electron tunnelling. *Nature Physics*, 2019 DOI: 10.1038/s41567-019-0683-5

Graphene filter traps airborne Bacteria

The laser-induced graphene is conductive foam of pure, atomically thin carbon sheets. It is synthesized through heating the surface of a common polyimide sheet with an industrial laser cutter. The self-sterilizing filters along with laser-induced graphene capture pathogens out of the air and kill them. This filter captures bacteria, fungi, spores, prions, endotoxins and other biological contaminants carried by droplets, aerosols and particulate matter. The filter requires little power, and heats and cools within seconds.

Reference:

Self-Sterilizing Laser-Induced Graphene Bacterial Air Filter. *ACS Nano*, 2019; DOI: 10.1021/acsnano.9b05983

Nano-thermometer

Scientists have developed a nano-thermometer able to take temperatures inside cells. The technique takes advantage of the fluorescent properties of a modified molecular rotor and the viscosity of the cell.

Reference:

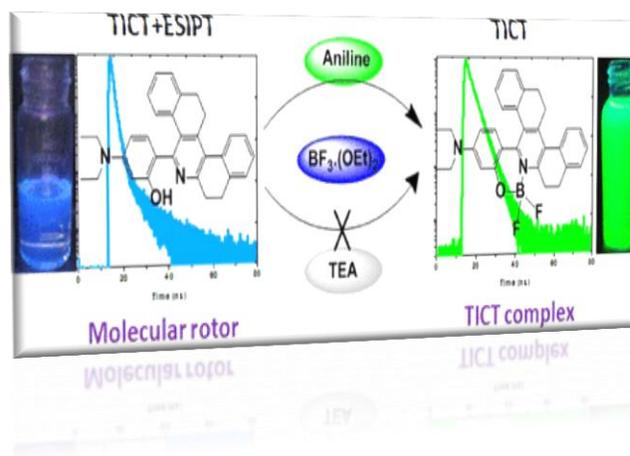
Sensing Temperature in Vitro and in Cells Using a BODIPY Molecular Probe. *The Journal of Physical Chemistry B*, 2019; DOI: [10.1021/acs.jpcc.9b04384](https://doi.org/10.1021/acs.jpcc.9b04384)

FACULTY'S RESEARCH



A Fluorescent Probe for the Detection of Aniline was developed!

The (Tetrahydrodibenzo[a,i]phenanthridin-5-yl)phenol as a fluorescent probe for the detection of aniline was developed by Dr. N.S. Karthikeyan research group, an Associate Professor of our Chemistry department. They published this work in the Journal of Organic Chemistry (*J. Org. Chem.* 84 (2019) 11513-11523, Impact Factor: 4.745), a journal published by American Chemical Society.



Regarding this article, we interacted with Dr. Karthikeyan, a corresponding author of this publication. He told that the advantage of the reported fluorescent probe can be selectively detecting aniline which can be viewed through the naked eye.

We excited! But, immediately we questioned the detection limit of this probe. "It is 12.65 nM", simultaneously replied by Dr. Karthikeyan.



A book chapter contribution on 'Applications of Degradable Polymers'

A book chapter (Chapter 17, pp: 403-422), 'A Review on Versatile Applications of Degradable Polymers' has written by **B. Jothimani, B. Venkatachalapathy, N. S. Karthikeyan, C. Ravichandran**. It was published in a book entitled, Green Biopolymers and their Nanocomposites, edited by Dr. Dhorali Gnanasekaran. This book was published by Springer Nature Singapore (ISBN 978-981-13-8063-1; eBook ISBN: 978-981-13-8063-1).

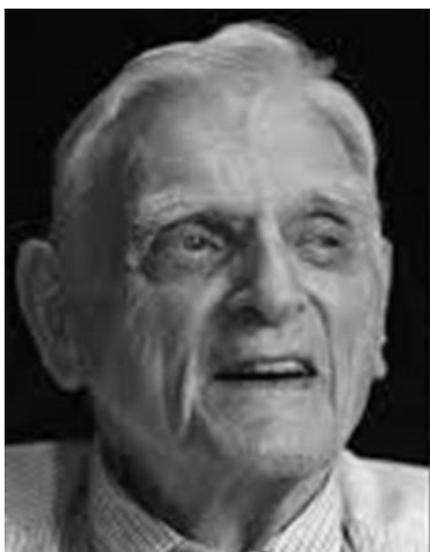
NOBEL PRIZE IN CHEMISTRY

Nobel Prize in Chemistry 2019 for lithium-ion battery

The Nobel Prize in Chemistry 2019 rewards the development of the lithium-ion battery. This lightweight, rechargeable and powerful battery is now used in everything from mobile phones to laptops and electric vehicles. It can also store significant amounts of energy from solar and wind power, making possible a fossil fuel-free society.



The Nobel Prize in Chemistry 2019 was shared by John B. Goodenough, M. Stanley Whittingham and Akira Yoshino



John B. Goodenough was born 1922 in Germany. He received Ph.D. (1952) from the University of Chicago, USA. Virginia H. Cockrell Chair in Engineering at The University of Texas at Austin, USA.



M. Stanley Whittingham, was born (1941) in the UK. He received Ph.D. (1968) from Oxford University, UK. Distinguished Professor at Binghamton University, State University of New York, USA.



Akira Yoshino was born (1948) in Japan. He received Ph.D. (2005) from Osaka University, Japan. Honorary Fellow at Asahi Kasei Corporation, Tokyo, Japan and professor at Meijo University, Nagoya, Japan.



EASWARI ENGINEERING COLLEGE

(Autonomous)

Approved by AICTE | Affiliated to Anna University, Chennai | NAAC - Accredited 'A' - Grade | 2(f) & 12(B) Status (UGC)
ISO 9001 : 2015 Certified | NBA Accredited programmes | FIST Funded (DST) | SIRO (DSIR)
Bharathi Salai, Ramapuram, Chennai - 600 089




Date
23.10.2019

DEPARTMENT OF CHEMISTRY

SCIENCE EXHIBITION

(An activity by RISE - Research in School Education)

Venue
TRP Auditorium

OBJECTIVES

- ◆ To ingrain a scientific and creative attitude in young minds.
- ◆ Promoting interest in Science and Technology among younger generation.
- ◆ Encouraging scientific and technological creativity among students and inculcating a sense of pride in their talent.
- ◆ To provide exploratory experiences, encourage creative thinking and promote psychomotor skills among students, through self-designed models.
- ◆ To encourage problem solving approach and developing appropriate technologies by applying scientific ideas in daily life situations.

WHO CAN PARTICIPATE?

STUDENTS OF CLASS IX to XII

Batch- I	IX & X
Batch- II	XI & XII

PRIZE PER BATCH

I PRIZE	- Rs. 5000/-
II PRIZE	- Rs. 3000/-
III PRIZE	- Rs. 2000/-

(Prize winners will be honoured with shield trophy)

PROGRAMME SCHEDULE

Exhibition time : 9.00 am to 2.30 pm
Valedictory &
Prize distribution : 2.30 pm to 3.30 pm

RULES & REGULATIONS

- ◆ Maximum of two teams per batch from a school.
- ◆ Maximum of three students per team.
- ◆ Models will be evaluated on the basis of originality & its applications in the field of science.
- ◆ **Last date for registration: 16.10.2019**
- ◆ Registration form can be sent by e-mail / post / WhatsApp



REGISTRATION ON FIRST COME, FIRST SERVE BASIS

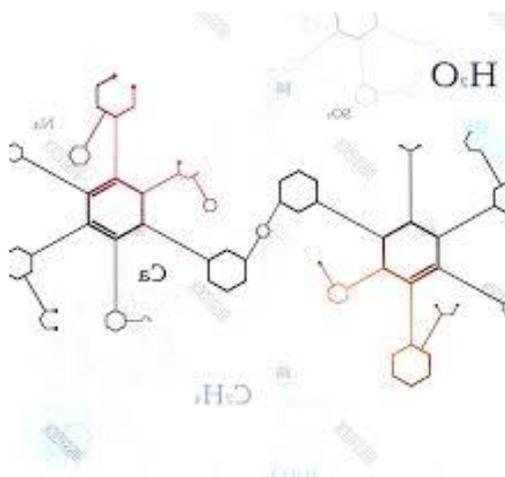
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| ☎ 044 - 43923029

Major achievements in the past years

- Having the Nodal Centre for Research activities.
- Four recognized supervisors for research work.
- Department has two funded projects for **60.92 lakhs** from various funding agencies like DST-SERB and AERB



- Received fund from AICTE and TNSTC for organizing National level conference and seminar.
- Our faculty members published more than 70 papers in National and International Journals.

Prepared by	Approved by
Editorial Team	HOD/Chemistry