



CHEMFLASH



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MESSAGE FROM THE HOD'S DESK

The Department of Chemistry has brought out its quarterly newsletter, **Chemflash**. Its focus is on all the recent happenings in the field of chemistry. This newsletter is sure to give a suitable platform to all the budding engineers to widen their perspective. I express my heartiest congratulations to all the staff and students who were behind the success of chemflash. I seek their continued co-operation in all the future endeavours.

Dr. C. Ravichandran
HOD/Chemistry

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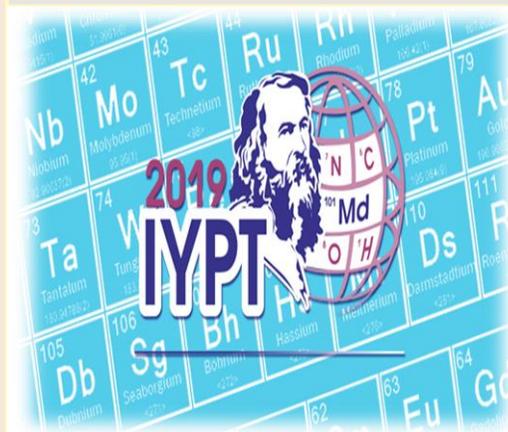
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ACADEMIC ACHIEVEMENTS

Prof. **C. Ravichandran**, HOD/Chemistry, has produced 100% results in Environmental Science and Engineering, II semester, 2019.



Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less.

— Marie Curie

BOARD OF STUDIES MEETING - 2019 - A NEW ERA

Since, Easwari Engineering College has become an autonomous institution from 2019 - 2020 onwards, Departments of Chemistry actively involved to design curriculum of the institution. We also planned to design new syllabus for courses, Chemistry for Engineers, Chemistry laboratory practical and Environmental science and Engineering which we are offering to all 1st year engineering students.



In this regard, on 17th July 2019, a board of meeting was successfully conducted. Expert members from Indian Institute of Science and Technology (IIT), Madras, Central Leather Research Institute (CLRI), Chennai, University of Madras, Chennai and Indian Additives Limited, Manali.



In this meeting, Dean (Research) and Dean (Academic), SRM Ramapuram campus were participated as special invitees.

Professor and Head, Department of Chemistry led this meeting successfully. All department faculties were also participated. After discussion, expert members appreciated the syllabus along with few suggestions.

We trust the new syllabus of Chemistry for Engineers, Chemistry laboratory practical and Environmental science and Engineering will empower chemistry and environmental knowledge of upcoming first year engineering students.



Man needs his difficulties because they are necessary to enjoy success.

You have to dream before your dreams can come true. We should not give up and we should not allow the problem to defeat us.

Great dreams of great dreamers are always transcended. Look at the sky. We are not alone. The whole universe is friendly to us and conspires only to give the best to those who dream and work.

Be more dedicated to making solid achievements than in running after swift but synthetic happiness. Unless India stands up to the world, no one will respect us. In this world, fear has no place. Only strength respects strength. Climbing to the top demands strength, whether it is to the top of Mount Everest or to the top of your career.

Do we not realize that self respect comes with self reliance? Those who cannot work with their hearts achieve but a hollow, half-hearted success that breeds bitterness all around.

-Dr. A. P. J. Abdul Kalam

SMARTPHONES DETECT EAR INFECTIONS

Mrs. V. Vanitha M.Sc., M.Phil., (Ph.D.)

Ear infection is one of the most common reasons for a visit to the doctor. Infected fluid in the middle ear, associated with fever and pain, often resolves without antibiotics, but complications can lead to meningitis and facial nerve paralysis. And even non-infected fluid, affecting up to 80% of children, can lead to an increased likelihood of later infection, as well as sleep and speech problems.

Now Justin Cha, Sharat Raju and their team from the University of Washington have found a way for parents to detect the problem early themselves, using only a smartphone and paper cone. The smartphone speaker emits three chirps, which are funnelled onto the eardrum by the paper cone, the template for which can be printed out and assembled at home with scissors and tape.

Meanwhile, the phone's microphone records both the emitted sounds and the echoes reflected by the eardrum. The two sound waves - the chirp and the echo - interfere with

one another during the journey to and from the phone. This creates a characteristic "dip" in the recording. In a healthy ear, the broad echo from the eardrum produces a wide dip.

But fluid in the canal connecting the outer to the middle ear restricts eardrum vibration, producing a narrower dip. The app uses the shape of the dip to compute the likelihood of there being fluid in the middle ear. The software uses a machine-learning algorithm, trained on data from patients from Seattle Children's Hospital aged between 18 months and 17 years old, and has the same predictive ability in infants under 18 months old.

The power of this approach comes from its accessibility and user-familiarity. Unlike expensive equipment restricted to professional use, the app uses hardware already built into the smartphone. Furthermore, parents were able to use the apparatus with the same reliability as healthcare professionals. While other diseases which alter eardrum mobility would show up as false positives, the result would prompt follow up with a clinician who could appropriately diagnose condition.

Health care systems around the world are under great amounts of stress, both in terms of financial resources and available practitioners, whereas smartphones are becoming increasingly widespread and available, including in developing countries. Could app-based diagnostics represent the medicine of tomorrow? We're all ears...

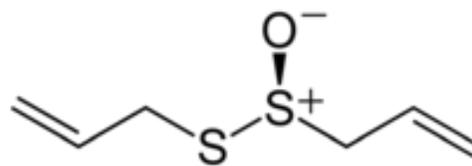
An app to detect fluid in the middle ears of babies and children, using only a smartphone and a paper cone, has been developed by researchers in the United States.....

Chemistry in Kitchen

Dr. M. J. Shanmugam

How garlic chase parasite away?

The sulphurous compound is called **Allicin**. Allicin is synthesized from **alliin** when garlic is crushed or bruised. **Allicin is an oily, yellow liquid**, which gives garlic its characteristic odour which is due to the **-S=O group**. **Allicin being a strongly oxidising compound**, it protects garlic from attack by bacteria and insects by disabling the enzymes that are found in the substrate necessary for infections to occur, thus acting as a natural insecticide. It does so by attacking the **SH groups** found on their active sites.



Structure of Allicin



- ✚ Your body, yes yours, has enough graphite inside of it to produce roughly 9,000 pencils. See, you are special after all.
- ✚ Adult humans are typically made up of approximately 60% water, however, at birth; we consist of nearly 80% water. After one year, the water content drops to 65%, and as the child ages, it stabilizes at 60%.
- ✚ The only metal which is also naturally antibacterial is copper. So, yes, there is some science behind the copper water bottle that your friend carries everywhere.

Know about the Periodic elements

The lightest element consisting of solely radioactive isotopes in **Technetium**, which is also the **first artificially** made element. However, technetium does not even have **one stable isotope**. As it was the first mostly artificial element to be added to the periodic table, its name is derived from the Greek word for "artificial."

Astatine is the rarest element on the planet. All the astatine isotopes are **short lived**, the most stable isotope is **astatine-210 with the half-life of 8.1 hours**. It can be obtained by **natural decay of bismuth, polonium or radon**.

Oganesson is one of only two periodical elements to be named after a living person, the other being **Seaborgium**, which is another synthetic element, known for being the most stable isotope. Atoms of this element were found by both **Soviet and American scientists in 1974**, which led to a dispute that would last 23 years between the two countries.

Dr. N.S. Karthikeyan visited Khalifa University - A research visit

Dr. N. S. Karthikeyan, Associate Professor, Department of chemistry, EEC has visited as invited researcher at Khalifa University, Abu Dhabi, United Arab Emirates.



He was staying nearly two months there and performing research in the area of petroleum products from biomaterials.



He worked in the laboratory of Prof. Fawzi Banat, Interim Department Chair & Professor, Khalifa University.



Exclusively, he involved in the preparation of bio-oil from coconut shell by fast pyrolysis process with a higher value-added product of carbonaceous solid residues (activated carbon) and mixture of combustible gases.

After successful completion of his project, he returns back to India on 18th July 2019.



Activated Carbon from Coconut shell

Nobel Price Facts

J. J. Thomson and G. P. Thomson (Father and son), who respectively awarded Nobels in 1906 for electrical conduction in gases (effectively for discovering the electron) and in 1937 for demonstrating electron diffraction. Their achievements have been summarized as J.J. Thomson showing that the electron is a particle and G. P. Thomson for showing that it is not (or) rather that the electron can also behave as a wave.

CHEMISTRY IN ARCHEOLOGY

Dr. P. Amaravathy

The purpose of archaeology is to learn more about past societies and the development of the human race. Over 99% of the development of humanity has occurred within prehistoric cultures, which did not make use of writing; thereby no written records exist for study purposes. Without such written sources, the only way to understand prehistoric societies is through archaeology. The problem of making a correct identification of ancient materials found in excavations may be very different from the problem of identifying the same materials in a fresh condition. Thus, for example, a clean piece of copper may be differentiated from a clean piece of bronze at a glance because of the difference in color, but no such difference is apparent when the two materials are in a highly oxidized condition, as they usually are when found in excavations. Furthermore, in the identification of materials found in excavations it is not so important to determine what a material is now, as it is to determine what it was originally before it underwent a series of chemical changes.

Archaeological chemistry belongs to the broader research field of archaeometry, which represents the application of various scientific analytical techniques to archaeological

artefacts. The application of archaeological chemistry has shifted the traditional archaeological research approach away from determination of artefacts' typologies and dating into the sphere of determining the preservation, variety and origin of organic molecules.

Many archaeological artefacts and sediments are porous and absorbent (pottery, bones, textiles, soil), which represents an excellent environment for trapping these molecules and slowing down their degradation during the post-depositional period. Lipid residues of cooking and the processing of other organic commodities have been found to survive in archaeological pottery vessels as components of surface and absorbed residues for several thousand years. Following extraction, using a combination of modern analytical techniques, including: high temperature-gas chromatography (HTGC), GC/mass spectrometry (GC/MS) and GC-combustion-isotope ratio MS (GC-C-IRMS), the components of the lipid extracts of such residues can be identified and quantified. An increasing range of commodities is being detected in pottery vessels, including animal products (meat and milk), leafy vegetables, specific plant oils and beeswax. Animal

fats are by far the most common residue identified from archaeological pottery with the use of compound-specific stable carbon isotope analysis allowing detailed characterisation of their source. GC-C-IRMS enables the carbon stable isotope ($\delta^{13}\text{C}$) values of individual compounds to be determined.

Classes of compounds, like sterols and bile acids from these anthropologically modified sediments provide an interesting insight into the world of past agricultural activities (manuring), waste water disposal or reveal traces of burial practices and ritual activities. Examination under ultra-violet light, for example, is especially useful for the critical examination of ivories and marbles. Similarly, infrared light and X-rays have been found useful in the detection of falsification.

For such a body of special knowledge, a distinct and separate branch of applied chemistry in itself, an appropriate descriptive name would be archeological chemistry.

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