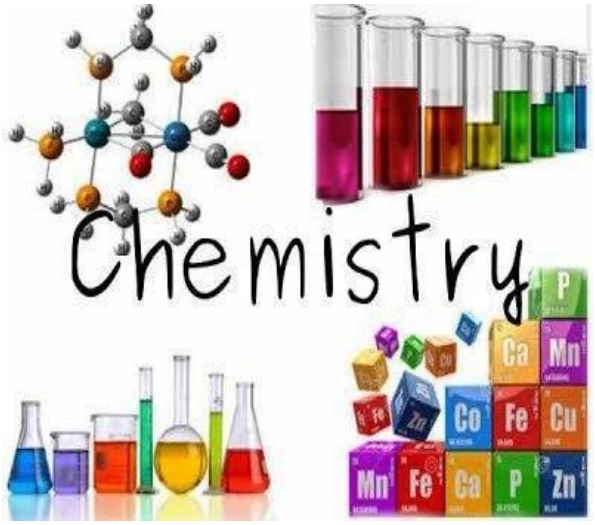

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CHEMFLASH

THE CHEMISTRY NEWS LETTER
EASWARI ENGINEERING COLLEGE

CONTENTS:

Do you Know:

For the first time scientists have found an organism that can produce chlorophyll but does not engage in photosynthesis. The peculiar organism is dubbed 'corallicolid' because it is found in 70 per cent of corals around the world and may provide clues as, how to protect coral reefs in the future.

MESSAGE FROM THE HOD'S DESK

Dr. C. Ravichandran
Professor and Head

The department of chemistry has brought out its quarterly news letter **chemflash**. Its focus is on all the recent happenings in the field of chemistry. This news letter 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

GUEST LECTURE

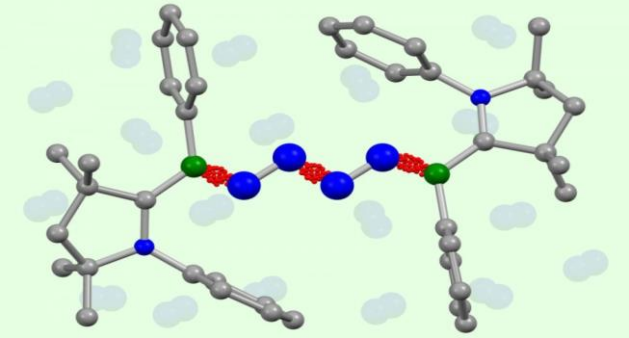
The Department of Chemistry has conducted guest lecture for first year students on 13.3.19 in Hi-tech hall-I. Dr. G. Sekaran, Formerly Chief Scientist and Cluster Chairman, Environmental technology Division, Central Leather Research Institute, Adar, Chennai 20 has delivered a lecture in the topic "Water its contaminants and treatment". He shared about Scarcity of water, various types of contaminants present in sewage water. And also he explained about "Treatment of sewage water" and uses of treated sewage water.

"CHEMSTAR 2019"

The Department of Chemistry has conducted "CHEMSTAR 2019" chemistry talent exam for first year B.E/B.Tech students on 13.3.19. The following I year B.E/B.Tech students have won prizes in the "CHEMSTAR 2019".

U. Ganesh Kumar	I IT - A	I
S. Hariniya	I IT - A	II
Mohan Raj	I Mech - B	III
S. V. Prathish	I CSE-B	Consolation Prize
S. Milan Kumar	I MECH-B	

Inert nitrogen forced to react with itself



Constituting over 78 % of the air we breathe, nitrogen is the element found the most often in its pure form on earth. The reason for the abundance of elemental nitrogen is the incredible stability and inertness of dinitrogen (N_2), a molecule comprising two nitrogen atoms and the form in which most nitrogen exists. Only in very harsh environments, such as in the ionosphere, can dinitrogen be assembled into longer nitrogen chains, forming N_4 ions with very short lifetimes.

Despite the inertness of dinitrogen, nature is able to use it as an important feedstock for all kinds of living organisms. In biological systems, the very strong nitrogen-nitrogen bond in N_2 can be cleaved and ammonia (NH_3) can be produced, which then becomes the source of nitrogen for the entire food chain on Earth.

Completely new chemical reaction

Imitating nature, humans use the all-important Haber-Bosch process to break down nitrogen into ammonia, which can then be further processed to produce fertilizers and to make nitrogen available for the production of pigments, fuels, materials, pharmaceuticals and beyond. The production of compounds that contain chains of two, three or four nitrogen atoms which are notably of pharmaceutical importance in vaso-dilating drugs, for example requires the reassembly of mono-nitrogen molecules such as ammonia, because no direct reaction exists that can directly connect molecules of dinitrogen.

The new process uses boron-containing molecules to directly couple two molecules of N_2 into a N_4 chain. For the first time, they have succeeded in directly coupling two molecules of atmospheric nitrogen N_2 with each other without first having to split the dinitrogen into ammonia, thus bypassing the Haber-Bosch process. This new method could enable the direct generation of longer nitrogen chains.

Opening the way to new chemistry

The new synthesis pathway functions under very mild conditions: at minus 30 degrees Celsius and under a moderate pressure of nitrogen (around four atmospheres). It also does not require a transition metal catalyst, unlike almost all biological and industrial reactions of nitrogen.

"This will open the way to a chemistry with which completely new chain-form nitrogen molecules can be synthesized. For the first time, nitrogen chains containing a special variant of nitrogen (15N isotope) can also be easily produced.

"With the help of complex computer simulations, unexpectedly complicated binding conditions in these beautiful molecules will enable to predict the future stability of such nitrogen chains and support our experimental partners in the further development of their discovery

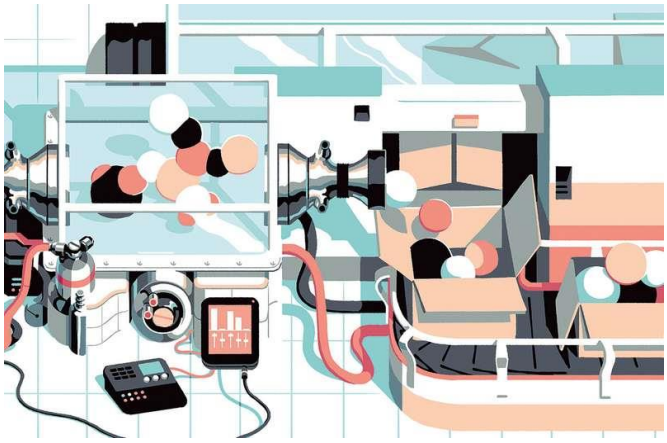
Lavanya N
I CSE-A

SCIENTIFIC FACTS

About Eye: New research shows that people with blue eyes have a single, common ancestor. A team at the University of Copenhagen have tracked down a genetic mutation which took place 6-10,000 years ago and is the cause of the eye colour of all blue-eyed humans alive on the planet today.

About Brain: The blood vessels that are present in the brain are almost 100,000 miles in length. There are 100 billion neurons present in the brain. In early pregnancy, the neurons develop at an alarming rate of 250,000 per minute. As we grow older, we are unable to remember new things. According to the researchers in the US it is because the brain is unable to filter and remove old memories which prevent it from absorbing new ideas.

All alchemists spit out the recipe to make any molecule



CHEMISTS have a unique power to manipulate matter. Imagine any arrangement of atoms we like and a chemist will have a good shot at stitching them together. Over the decades, their round-bottomed flasks have helped bring all sorts of new compounds into being from dazzling pigments to miracle pills and wonder materials. But they don't come easy, not least because chemists must do it all backwards.

They tried-and-tested method for planning how to create a sophisticated molecule starts where we would like to end up. We have to draw out the web of connected atoms we want to make, then pick it apart, working backwards to plot out a series of reactions that, if performed in the reverse order, will get us to our goal.

It is a simple, old and indispensable idea that won its inventor a Nobel prize. Plenty of the last century's finest drugs have chemical structures so fiendishly complicated that they could never have been made without a logical reverse engineering.

> **"Chess and chemistry are very similar. They're both about plotting moves"**

Yet with thousands of possible ways to make compounds of even middling complexity, it is tough for humans to spot the best routes. That is why a few chemists think the quickest path to molecules more wondrous than ever lies in taking themselves out of the equation.

Most of the biological world is built of organic, or carbon-containing, molecules. From hormones to vitamins to poisons, organic chemists have long tried to both divine their structures and find ways to make them.

S. Chandrika

I Mech A

New study measures UV-filter chemicals in seawater and corals from Hawaii

Scientists have completed the first comprehensive assessment of UV-filters in surface seawater, sediment, and coral tissue from multiple coral reefs around the island of Oahu, Hawaii. UV-filters are active ingredients in sunscreens, but are also added to many other products, including textile, plastics, and paint to prevent photo degradation. The UV-filters oxybenzone and octinoxate have received attention by policy makers regarding their potential impact on corals. The research will help provide a baseline for future risk assessments.

Globally corals are in serious decline with major threats from increasing temperatures due to climate change and disease. New threats from chemical contaminants in seawater are an emerging area of concern, particularly near coral reef areas with high-density population, tourism, or recreational activities. The detection of sunscreen active ingredients (i.e., UV-filters) in the aquatic environment has raised concerns over potential adverse impacts on coral reefs. However, there is very limited scientific data on their environmental concentrations in seawater near coral reefs in Hawaii.

To help address these data deficiencies, University of Maryland Center for Environmental Science and University of Maryland, Baltimore County researchers measured the concentration of 13 UV filters, including oxybenzone and octinoxate, in seawater, sediment, and coral tissues. Other organic chemicals (e.g., sucralose and surfactants, synthetic hormones and polycyclic aromatic hydrocarbons [PAHs]) were also analyzed in the study.

Our study vastly expands the current body of scientific data needed to assess the environmental risk of these chemicals to corals.

Overall, the impacts of oxybenzone and octinoxate to intact corals occur at much higher concentrations than this study found in seawater near coral reefs. Currently, there are only five studies that have looked at the toxicity of oxybenzone and/or octinoxate to corals, so much more research on the toxicity to corals is needed.

Kaviyasree C.L

II IT - A

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