

EASWARI ENGINEERING COLLEGE
Ramapuram, Chennai - 600 089.
DEPARTMENT OF CHEMISTRY



CHEMFLASH

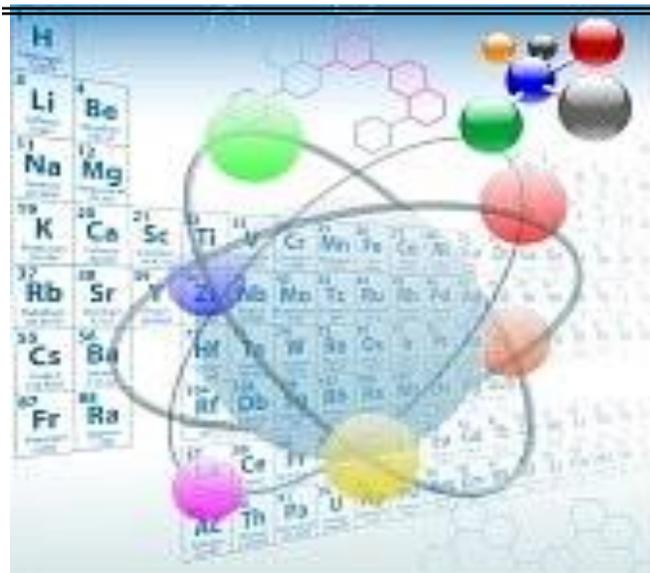


THE NEWS LETTER

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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

DEPARTMENT ACHIEVEMENTS

PAPER PRESENTATION:

Mrs. R. Anitha Devi, Mrs. V. Vanitha and AR. Anusa, Assistant professors have presented a research paper in National conference on Advances in Chemical Sciences and Technology on 3rd February 2017 at KCG College of Technology, Chennai.

100% RESULT:

Mrs. AR. Anusa has achieved 100% result in the subject Engineering Chemistry-I for the academic year 2016-17.

CHEM STAR 2017"-Talent exam:

Convener : Dr. C. Ravichandran

Coordinator : Dr. S. Dhandayuthapani

The following I year B.E/B.Tech students have won prizes in the "CHEMSTAR 2017"- chemistry talent exam which has been held on 09.03.17.

S. No	Reg. No	Name of the student	Year/Branch/Section	Prize
1.	310616105071	SATHIYENDREN. M	I EEE-B	I
2.	310616105018	GANAPATHI. S	I EEE-A	II
3.	310616103071	SURENDRAN.P.N	I CIVIL-B	III
4	310616104041	JANE GLORIA. F	I CSE-A	Consolation Prize

Northern Lights No More

Decreasing solar activity will affect sun and in turn planet Earth.

Britain may lose the magic of the northern lights by the middle of the current century as a result of major shifts in solar activity, scientists have discovered. Space scientists at UK conclude that plummeting solar activity will shrink the over all size of the sun's atmosphere by a third and weaken its protective influence on the Earth.

This could make the Earth more vulnerable to technology-destroying solar blasts and cancer causing cosmic radiation, as well as making the aurora less common away from the north and south polar region for 50 yrs or more.

There is also evidence that it is due to plummet, possibly by the largest amount for 300years said Mathew owens from Readings meterology department. As the sun becomes less active, sunspots and coronal ejections will become less frequent. However, if a mass ejection did hit the Earth , it could damage the electronic devices on which society is now so dependent he said.

The scientists believe the coming grand minimum could be similar to the minimum of the 17th century, when sun spot activity almost stopped another symptom of a less active Sun.

Solar wind, made up of electrically charged particles from the sun travels at around a million miles per hour. A reduction in solar wind would see the heliosphere –The 'bubble' around the solar system maintained by particles emitted by the sun shrink significantly.

The protective bubble helps shield the Earth from harmful radiation from outer space, but has weakened since 1950's. Earth's own magnetic field also deflects some of this radiation.

Protecting biomolecules against light-induced damage

When the molecules that carry the genetic code in our cells are exposed to harm, they have defenses against potential breakage and mutations. For instance, when DNA is hit with ultraviolet light, it can lose excess energy from radiation by ejecting the core of a hydrogen atom - a single proton -- to keep other chemical bonds in the system from breaking.

To gain insight into this process, researchers used X-ray laser pulses from the Linac Coherent Light Source (LCLS) at the Department of Energy's SLAC National Accelerator Laboratory to investigate how energy from light transforms a relatively simple molecule, 2-thiopyridone. This molecule undergoes a chemical transformation that also occurs in the building blocks of DNA. The scientists looked at this process by probing the nitrogen atom in the molecule with X-ray pulses that lasted just femtoseconds, or quadrillionths of a second.

Photoexcitation in 2-thiopyridone is small enough to understand and has only one nitrogen atom. This is also the first time the method, known as resonant inelastic X-ray scattering or RIXS, has been used at BESSY II to look at molecular changes involving nitrogen that happen in femto seconds. This short timescale is important because that's how fast protons are kicked away from molecules exposed to light, and it requires brilliant X-rays to see these ultrafast changes.

"LCLS is the only X-ray light source that can provide enough photons -- particles of light," In the study, the researchers used an optical laser to initiate changes in the molecule, followed by an LCLS X-ray probe that allowed them to see movements in the bonds. These "on-resonance" studies amplify the signal in a way that scientists can clearly interpret how X-rays interact with the sample. The research team looked primarily at the bonds between atoms neighbouring nitrogen, and confirmed that optical light breaks nitrogen-hydrogen bonds.

X-rays used to probe the sample don't break the nitrogen-hydrogen bond, so the probe itself does not create an artificial effect. The X-ray energy is instead transferred to a bond between nitrogen and carbon atoms, rupturing it.

RESHMA V
IEIE-B

Making Vanilla Flavoring with Less Pollution

In small amounts, vanilla flavoring enhances the taste of our baked goods, desserts and ice cream. But making it synthetically, which is the most common route to keeping the ingredient affordable these days, creates a stream of wastewater that requires treatment before it can be released into surface waters. Now researchers report a new "greener" way to make vanillin, the primary flavor compound in vanilla.

Although consumers have been demanding more "natural" foods in recent years, less than 1 percent of vanilla flavor produced globally comes from its original natural source, the vanilla orchid. The rest is synthesized from a petroleum-derived precursor called guaiacol, tree lignin and other substances such as cow feces. But the catalysts currently used in the manufacturing of vanillin are polluting and can only be used one time. So Ganapati D. Yadav and Shivaji L. Bhanawase sought an improved method to make the popular flavor compound.

The researchers created a catalyst by encapsulating copper-aluminum hydrotalcite in silica. Testing showed that it efficiently spurred the separation of vanillin from other compounds. The catalyst worked in water under ambient air pressure, and eliminated the need for a polluting step involving hydrochloric acid that current techniques require. The catalyst could also be recovered and re-used. The researchers say that their process could be economically scaled up for a more environmentally friendly approach to making commercial vanillin.

ABINAYA R

I EIE- A

A 'Bionic Leaf' Could Help Feed the World



In the second half of the 20th century, the mass use of fertilizer was part of an agricultural boom called the "green revolution" that was largely credited with averting a global food crisis. Now, the challenge of feeding the world looms again as the population continues to balloon. To help spur the next agricultural revolution, researchers have invented a "bionic" leaf that uses bacteria, sunlight, water and air to make fertilizer in the very soil where crops are grown.

The first "green revolution" in the 1960s saw the increased use of fertilizer on new varieties of rice and wheat, which helped double agricultural production. Although the transformation resulted in some serious environmental damage, it potentially saved millions of lives, particularly in Asia. But the world's population continues to grow and is expected to swell by more than 2 billion people by 2050, with much of this growth occurring in some of the poorest countries, according to the U.N. Providing food for everyone will require a multi-pronged approach, but experts generally agree that one of the tactics will have to involve boosting crop yields to avoid clearing even more land for farming.

To contribute to the next green revolution, Nocera, who is at Harvard University, is building on the work he's most famous for -- the artificial leaf -- to make fertilizer. The artificial leaf is a device that, when exposed to sunlight, mimics a natural leaf by splitting water into hydrogen and oxygen. This led to the development of a bionic leaf that pairs the water-splitting catalyst with the bacteria *Ralstonia eutropha*, which consumes hydrogen and takes carbon dioxide out of the air to make liquid fuel. Last June, Nocera's team reported switching the device's nickel-molybdenum-zinc catalyst, which was poisonous to the microbes, with a bacteria-friendly alloy of cobalt and phosphorus. The new system provided biomass and liquid fuel yields that greatly exceeded that from natural photosynthesis.

"Getting to that point showed that you can have a renewable chemical synthesis platform. Now scientists are demonstrating the generality of it by having another type of bacteria take nitrogen out of the atmosphere to make fertilizer."

"I can then put the bug in the soil because it has already used the sunlight to make the bioplastic," Nocera says. "Then the bug pulls nitrogen from the air and uses the bioplastic, which is basically stored hydrogen, to drive the fixation cycle to make ammonia for fertilizing crops."

Nocera's lab has analyzed the amount of ammonia the system produces. But the real proof is in the radishes. The researchers have used their approach to grow five crop cycles. The vegetables receiving the bionic-leaf-derived fertilizer weigh 150 percent more than the control crops.

**MITHRA S
I EIE A**

Article on Mahendra Singh Dhoni

Best in the World Belief in himself, the will to win, the fear and respect of the rivals--he has it all. India's star player is sheer genius. What makes him a living legend?

"TILL THE FULL STOP DOESN'T COME,
THE SENTENCE IS NOT COMPLETE."

CHILDHOOD

Mahendra Singh Dhoni was born on July 7, 1981 at Ranchi, Jharkhand located in the east corner of India. He studied at DAV Jawahar Vidya Mandir where he was keenly interested in football and badminton. MS Dhoni comes from a typical family. His father Pan Singh, worked for MECON and his mother Devki Devi is a housewife. He has an elder brother, Narendra Singh Dhoni, who is a politician, and a sister, Jayanti Gupta, who is a teacher. MS Dhoni he was the goalkeeper of his football team and was able to play for the district and state level. But on the insistence of his football coach, he tried out to play cricket.

EARLY CAREER

He was able to perform wicket keeping especially well which allowed him entry into a local cricket club called the Commando cricket club where he played from 1995-1998. In the 1997/98 season, his superb performance in the Vinoo Mankad Under-16 Championship attracted the selector's eye. His improved batting and keeping performances led to him to be selected to the Bihar Ranji Trophy squad for the 1999/00 season.

He scored his first century the next season but was only able to score at an average of around 40 per game by the 2003 season. In 2003, he was selected to the India A team which went to tour Kenya to play a tri-series tournament with Pakistan A as the third team. In the series he scored 362 runs at an average of 72.40 with back to back centuries against Pakistan. He was made the captain of the ODI team in 2007 and the Test team in 2008. In 2009, he scored 1198 runs in 24 innings at an average of 70.43 to be the highest scorer of the year in ODI's.

He has been awarded the RAJIV GANDHI KHEL RATNA which is the highest sports honor given by the government of India in the year 2008. In 2011 India Won the ICC World Cup Champion Trophy after the 28 years he played brilliant innings against Sri Lanka. Dhoni is the successful captain that India ever had. He led India to 27 Test match victories in 60 Tests and 107 ODI wins in 194 Odis as a captain 70 T20 matches and he had 40 wins in his account.

On 4th January 2017, Dhoni stepped down as captain of India's limited-overs team ahead of the ODIs and T20s against England. However, he is still available as a wicketkeeper-batsman. He took the decision in order to give the younger players a chance to lead the side to the next level. He will definitely be remembered as one of the most successful India captains in the history of the sport.

N. SANTHOSH KUMAR

I YEAR IT-B

