

IIT KHARAGPUR SCIENTISTS DEVELOP A TINY BLOOD pH SENSOR

Meenu S
II DC Chemistry

Researchers at the Indian Institute of Technology (IIT) Kharagpur have successfully developed a small device to measure the pH of any solution, with preliminary studies showing its usefulness to measure the pH of blood. Unlike the conventional approach of measuring the pH of blood potentiometrically, the device works by measuring the impedance. The device was found to have satisfactory pH sensitivity in the physiological pH range. In contrast to conventional arterial blood-sampling devices that are bulky as they use three electrodes and with time-consuming processes, the miniature device relies on venous blood sampling for pH measurement.

BOOST YOUR BRAIN WITH COFFEE!

Greeshma Rajeevan
I DC Chemistry

Are you tired to attend your chemistry class? Or are you so stressed to write your chemistry exam? Then, here is a best brain booster, which is nothing other than COFFEE. It is not just a tasty dark brown drink. It has a lot of benefits. Even its aroma contains more than 800 chemicals which makes it soothing. Coffee makes us feel less tired and it increase our energy levels. It is because it contains a stimulant called caffeine, which is the most commonly consumed psychoactive substance in the world. "Caffeine" is the common name for 1,3,7-trimethylxanthine. A brain chemical called adenosine regulates drowsiness. Caffeine and adenosine molecules have similar shapes. So they can both bind to proteins on brain cells called adenosine receptors. When we feel sleepy, adenosine molecules bind to these receptors. But when we drink coffee, some caffeine molecules attach to these same receptors and make us alert. Italian researchers found that coffee consumption lowers the risk of liver cancer by 40%. It also lowers the incidence of liver cancer. It is the largest source of antioxidants. It also reduce the risk of Alzheimers disease. coffee also helps us to relieve our stress.

CHEMISTRY POEM

Karishma Satheesan
II DC Chemistry

YO...YO!
Mixtures and Solutions
now, I won't lie
can get a little tricky if you don't try

Mixtures can be separated
With your hand
Like spaghetti, fruit salad,
And rocks and sand!

solutions are so different
like the ocean combination
the only way to separate
is with evaporation

YO!

Liquids

A liquid moves smoothly.
We say that it flows.
From one place to another—
How quickly it goes!

We know that most liquids
Are easy to see.
With no shape of their own,
They're not like you and me.

Three States of Matter

Aiswarya G R
I DC Chemistry

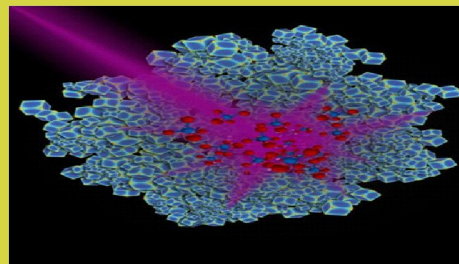
Across

- 1 Has a definite shape and a definite volume
- 2 A change from a liquid to a gas
- 3 A change from a solid to a liquid
- 4 A change from a liquid to a solid
- 5 The amount of matter in an object
- 9 The amount of space taken up by an object

Down

- 1 Solid, liquid and gas
- 4 Has a definite volume but takes the shape of its container
- 5 A property of matter
- 7 Takes the shape and volume of its container

LIGHT-DRIVEN REACTION CONVERTS CARBON DIOXIDE INTO FUEL

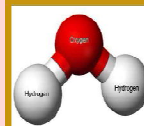


Researchers have developed tiny nanoparticles that help convert carbon dioxide into methane using only ultraviolet light as an energy source. Having found a catalyst that can do this important chemistry using ultraviolet light, the team now hopes to develop a version that would run on natural sunlight, a potential boon to alternative energy. Duke University researchers have engineered rhodium nanoparticles (blue) that can harness the energy in ultraviolet light and use it to catalyze the conversion of carbon dioxide to methane, a key building block for many types of fuels

Chocolate box batteries



Recipe for an improved lithium-sulfur battery cathode
Motivated by the ganache centre, hard chocolate coating and hazelnut sprinkles of a truffle, scientists in the US have mimicked this design to form a layered lithium-sulfur battery cathode with a sulfur-carbon centre encapsulated in a multi-layered polymer shell sprinkled with carbon. The truffle inspired carbon nanoparticles consist of a carbon infused sulfur core and an ion-selective polymer shell



THANMATHRA

News letter of the Department of Chemistry

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SREE NARAYANA COLLEGE FOR WOMEN, KOLLAM

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WE THINK THERE IS COLOR, WE THINK THERE IS SWEET, WE THINK THERE IS BITTER, BUT IN REALITY THERE ARE ATOMS AND A VOID

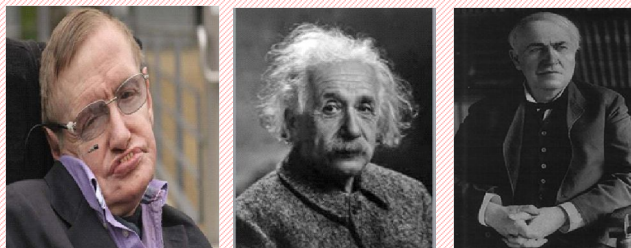
Chemistry is the branch of science that deals with the identification of the substances of which matter is composed; the investigation of their properties and the ways in which they interact, combine, and change; and the use of these processes to form new substances. Everything on earth is made up of chemicals: you, your food, and the products you use in daily life such as soaps, perfumes etc. all are made up of chemicals. Life without chemicals is impossible. A number of changes that you observe are the result of chemical reactions like the rain, the change in the color of leaves, cleaning of any particular material in your house, all involve chemicals. The basic knowledge of chemistry is essential for all; you need to understand certain chemical reactions. What does your packet food expire? What disinfectants and repellents you should use to keep your house hygienic and healthy and so on. Chemistry is important because it helps in exploring things which are unknown to mankind. Chemistry is important for the environment. When you are aware of the harmful effects of the gases like carbon

dioxide and methane as a result of greenhouse effect, you can easily carve out the solutions for the reduction of its effects on the environment. If you possess a minimum knowledge of the importance of chemistry you can help in saving the environment to a large extent.

The marvels of chemistry are endless. The chemist is the magician who can turn waste products into things both beautiful and useful. Thus from coal one gets coal-gas and its bye-product, coal-dyes, saccharine and many more substances. Waste products like sawdust can be made to yield oil and acids. Marvelous indeed are the achievements of modern chemistry.



The theme selected for the National Science Day, 2017 “Science and Technology for Specially Abled Persons”



History has witnessed some of the most outstanding achievements by men and women in due course of time. However, the achievement is even more appreciated if has been addressed with an apparent physical disability. It takes courage for any ordinary to man achieve a feat like success when he lacks at something; it simply requires passion for a person with disability to level the fame.

CONFIRMATION OF FOUR NEW ELEMENTS COMPLETES SEVENTH ROW OF PERIODIC TABLE



IUPAC endorse discovery of elements 113, 115, 117 and 118 by teams in Russia, Japan and the US. IUPAC confirmed the naming of the new elements: **nihonium**, **moscovium**, **tennessine** and **oganeson**.

CHENNAI TEAM TURNS LEATHER WASTE INTO CARBON FOR ELECTRODES

ai f tdr mh f at dcf stx b tdr ovr sf etlou tdbscr otx lu r vu
r zlell ohtu f tdi s n lvn

Anagha TS
II DC Chemistry

Researchers at the Vellore Institute of Technology University, Chennai have successfully converted leather solid waste (wet blue leather splits) containing chromium (III) into porous carbon matrix for use as electrodes in super capacitors using a simple, sequential, two-step process. This approach not only yielded “excellent porous electrode material for super capacitors”, but also effectively addressed the management of chromium containing leather solid waste, which is considered to be the major issue of leather manufacturing industry. The results were published in the *Journal of Hazardous Materials*.

CHEMISTRY JOKES !!!

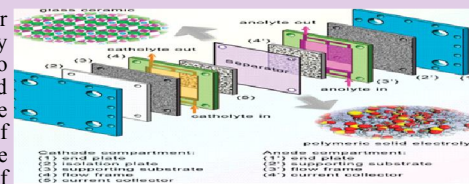
Fathima
I DC Chemistry

1. If H_2O is a formula of water, what is the formula of ice? - H_2O cubed
2. What is a cation afraid of? - A dogion
3. What fruit contains Barium and double sodium? BaNaNa
4. What is the chemical formula of coffee? $CoFe_2$
5. What did argon do when copper insulted him? Argon had no reaction
6. What did one titration say to other? “Let’s meet at the endpoint”
7. What is the chemical formula for the molecules in candy? - $CHOCOlaTe$

LITHIUM REDOX FLOW BATTERIES

Anushma Johnson
II DC Chemistry

The increasing need for greater amounts of electrical energy storage is driven by the need to provide greater flexibility and stability to cope with the increasing production of renewable energy. Batteries are effective tools for storage of energy. But what we need the most in this technologically developed century is not an ordinary battery. Technology calls out for new trends ensuring low cost of production and high capacity. Li-redox flow battery represents such a new trend towards the design of next-generation alkali-ion battery with lower cost than conventional Li-ion batteries, and a voltage greater than conventional redox-flow battery based on proton chemistry. A Li-redox flow battery uses



lightweight Li^+ -ion as its charge carrier, and liquid phase redox reaction from redox molecule with relatively high redox potential as active material in the

cathode, metallic lithium or soluble redox molecule with relatively low redox potential as active material in the anode. The amount of energy stored is determined by the amount of redox molecules, while power density is determined by redox kinetics of redox molecules and the rate of mass/charge transport inside the cell. Li-redox flow battery represents a promising electrical energy storage system for large-scale energy storage due to its modulation and transportability.

NEW LIGHT ON DARK MATTER

Ammu Thankappan
II DC Chemistry

Dark matter is as mysterious as it sounds very little is known about it, save that it makes up about 85 per cent of all the matter in the universe. Now, German and Hungarian scientists have thrown some light on a type of dark matter particle that has been postulated, known as the axion. They have established that axions can have a mass between 50 and 1500 micro electron computation has been published in the journal Nature. An interesting fact is that these calculations were done numerically using a (Bluegen/Q) super computer, JuQueen, housed in the Julich Supercomputer Centre in Germany. Dark matter is so known because it interacts weakly with matter and so is notoriously difficult to detect. Yet, indirect proof of its existence comes from observation of rapidly rotating galaxies, which cannot

be held together merely by the gravitational pull of the matter they contain-there has to be a lot of invisible stuff known as “dark matter” to prevent them from flying apart with the force of their own energies. Such inferences imply that nearly 85 per cent of the universe is made of dark matter, the known matter only contributes 15 per cent. Several candidate particles have been postulated that may constitute dark matter-both highly massive and lightweight- but none of the experiments have detected any such particle so far, directly. Axions are particles proposed by extending quantum chromodynamics (QCD) the theory that describes “strong interactions,” the way quarks and gluons bond to form matter particles such as protons, neutrons etc.

HUNGRY BACTERIA CAN EXTRACT ENERGY FROM SEWAGE

Lija Thampi
II DC Chemistry

Sewage contains a source of energy that can be harvested by using hungry bacteria, researchers from Ghent University in Belgium have discovered. The levels of organic matter in sewage are too low to be directly recovered. They periodically starve the bacteria, in a kind of ‘fasting regimen’ Afterwards, wastewater is briefly brought into contact with the starved bacteria which are gluttonous and gobble up the organic matter without ingesting all of it. This enables to harvest the

undigested materials for the production of energy and high quality products. The researchers said their approach is unique because they have developed a high rate variation of the so-called contact-stabilisation process. By using the contact-stabilisation process, up to 55 per cent of the organic matter could be recovered from sewage, the researchers said.