

EASWARI ENGINEERING COLLEGE

Ramapuram, Chennai - 600 089.

DEPARTMENT OF CHEMISTRY



CHEMFLASH

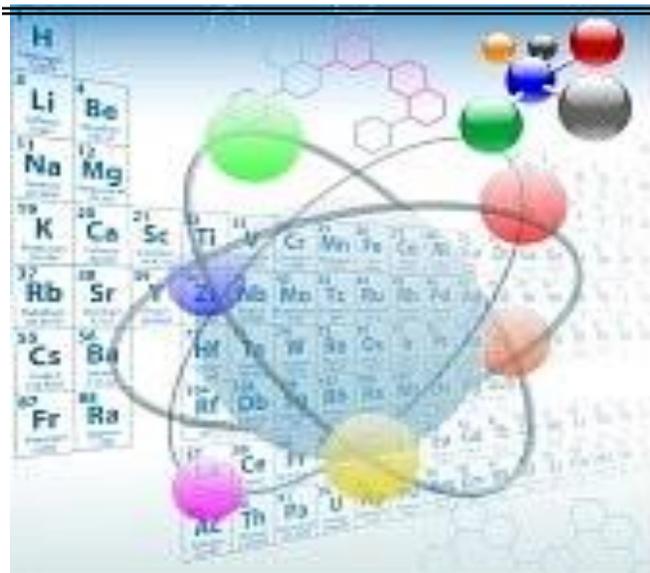


THE NEWS LETTER

Vol. - 5

Issue no: 3

January 2017



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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

FUNDED PROJECT:

The Department of chemistry has received **one funded project** from **AERB** for about **37.93 lakhs** under the principal investigator Dr. N.S. Karthikeyan and Co-Principal Investigators Dr. C. Ravichandran, Dr. B. Venkatachalapathy and Dr. M. Kumar.

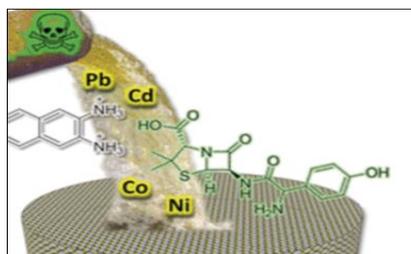
SOMETHING INTERESTING:

- Popping bubble wrap is not as fun when you realize that you are releasing toxic Chinese air into your home 1cm^3 at a time.
- The Basenji Dogs are the only breed of dogs which is not able to bark.
- The World's first selfie was taken in 1839 by Robert Cornelius, was also the first ever photographic portrait of human being.
- The world's tallest water slide is located in Kansas city. It is taller than Niagara falls.
- Japan has over 50 flavours of 'Fanta'
- There is a town in Arizona called 'Nothing' which literally has nothing but a gas station and a garage.

P. Pon Shiva
I- MECH B

TOUGH AQUA MATERIAL FOR WATER PURIFICATION

Robust Membranes: Water purification processes usually make use of robust membranes for filtering off contaminants while working at high pressures. Israeli scientists report in the journal *Angewandte Chemie* that a supramolecular aqua material can be utilized as a sustainable membrane for water purification at high pressures. Normally, a membrane obtains its toughness from the formation of a polymeric network made of covalent bonds. However, polymeric membranes are difficult to clean and recycle, while easy fabrication, cleaning, and recycling can greatly enhance the sustainability of the membranes. Supramolecular systems in principle fulfill many of the sustainability requirements, but they lack robustness.



Two Components Working Synergistically

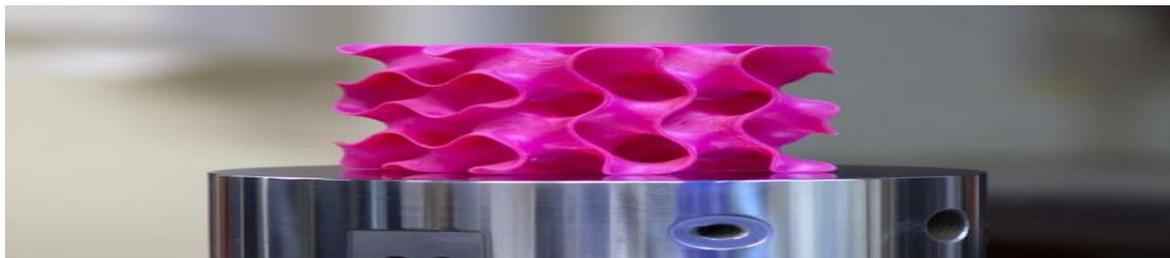
The Rybtchinski group from the Weizmann Institute of Science, Israel, and researchers from BASF have combined two membrane components, working in synergy, to form a hybrid membrane that is robust and can be easily fabricated and disassembled, thus being highly advantageous for the challenges presented by industrial water purification.

Nafion, which is a sulfonate polyelectrolyte with Teflon-like fluorocarbon backbone, is known for its ion-exchange properties. A noncovalent PP2b network can be used to build water-based membranes with filtering properties but lacking the robustness required from "aqua materials", also known as "aqua plastics". Rybtchinski and colleagues combined both materials through the deposition of colloidal Nafion on a PP2b layer and found that the two layers interacted advantageously: "Overall, a hydrogel-like material featuring a 3D Nafion network and strongly densified PP2b layers is formed.

Removing Contaminants: Mechanical compression, hydrophobic forces, and osmotic pressure caused the formation of a dense hybrid membrane structure. The scientists then tested the layered material for the removal of toxic heavy metals and small organic molecules such as dyes and drugs from contaminated water. It was highly effective in both, and the researchers explained that "The Nafion layer acts as a membrane with ion exchange properties, while the densification of PP2b appears to play a role in the size-selective rejection." Remarkably, the hybrid membrane sustains high pressures and can also be easily disassembled for cleaning and recycling. These favorable properties induced through synergistic self-assembly make such aqua materials good candidates for demanding large-scale industrial applications.

R. MONISH SAMUEL
I MECH B

ULTRALIGHT 'SUPER-MATERIAL' IS 10 TIMES STRONGER THAN STEEL



A new material is incredibly light yet stronger than steel. The new material gets its amazing strength from its unique geometric configuration.

A spongy new super-material could be lighter than the flimsiest plastic yet 10 times stronger than steel. The new super-material is made up of flecks of graphene squished and fused together into a vast, cobwebby network. The fluffy structure, which looks a bit like a psychedelic sea creature, is almost completely hollow; its density is just 5 percent that of ordinary graphene. Though the researchers used graphene, the seemingly magical properties of the material do not totally depend on the atoms used: The secret ingredient is the way those atoms are aligned, the scientists said.

IS THERE AN ELEMENT ZERO?

The periodic table contains a wide array of elements, numbered from one (hydrogen) to 118 (oganesson), with each number representing the number of protons stored within an atom's nucleus. Scientists are constantly working to create new elements by cramming more and more protons into nuclei, expanding the periodic table. "Element zero" has been a matter of conjecture for nearly a century, and no scientist searched more ardently for it than German chemist Andreas von Antropoff. It was Antropoff who placed the theoretical element atop a periodic table of his own devising, and it was also he who thought up a prescient name for it: neutronium. Today, the term commonly refers to a gaseous substance composed almost purely of neutrons, found within the tiniest, densest stars known to exist: neutron stars.

Neutron stars are the collapsed cores of large stars. Just twenty kilometers wide, they hold the mass of one to three Suns. The incredible mass comes from how they are composed. The stars are made up almost entirely of neutrons clumped together by intense gravity. Neutrons normally exist only within nuclei of atoms, making their congregation an astronomical rarity, and deserving of a cool name, the aforementioned "neutronium". Neutronium is theoretically devoid of protons, so on face value it fits the bill, as no protons would mean no atomic number. With that said, such a definition would certainly require some creative thinking. Neutronium only dwells under the crushing gravity of a neutron star. Extract a teaspoon of the stuff (roughly equal to the mass of a mountain) and it will decay almost instantly with "tremendous" radioactivity. To consider neutronium a stable element we'd almost need to think of a neutron star as an atomic nucleus.

**ABINAYA R
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DO YOU KNOW

ELECTRIC CLOTHES

Physicists have developed a fabric that doubles as a spare outlet. When used to line your shirt or even your pillowcase or office chair — it converts subtle differences in temperature across the span of the clothing into electricity. And because the different parts of your shirt can vary by about 10 degrees, you could power up your MP3 player just by sitting still. According to the fabric's creator, a cellphone case lined with the material could boost the phone's battery charge by 10 to 15 percent over eight hours, using the heat absorbed from your pants pocket.

EARTH HAS A TINY SECOND MOON

According to NASA, we're no longer a single moon-planet. A small asteroid known as 2016 HO3 has become trapped in the Earth's orbit, although in quite an irregular fashion. It might be fairly small and insubstantial, but it'll be around for awhile.

WE MIGHT HAVE A NINTH PLANET IN OUR SOLAR SYSTEM AGAIN

Astronomers from the California institute of technology have reported new evidence that a large, icy planet has been patiently waiting to be found in the darkness beyond Pluto's orbit.

S.NAGARAJAN
I MECH B

AMAZING FACT:

The average person walks the equivalent of five times around the world in a lifetime.

The average moderately active person take around 7,500 step/day. If you maintain that daily average and live until 80 years of age, you'll have walked about 216,262,500 steps in your lifetime. Doing the math ; the average person with the average stride living until 80 will walk a distance of around 110,000 miles. Which is the equivalent of walking about 5 times around the Earth, right on the equator.

V.SHREE GOWRI SANTHOSH
I- ECE C

QUOTE

Science is simply the word we use to describe a **Method of organizing** our **Curiosity** . The **science** of today is the **technology** of tomorrow.

