



Embassy of India, Berne

# INDIA SCIENCE AND INNOVATION WEEKLY

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*Ask the right questions, and nature will open the door to her secrets  
- Dr. C.V. Raman, The Nobel Prize in Physics 1930*

## **IIT-Madras Generated Hydrogen from Seawater Using Solar Energy**

Researchers from the Department of Physics from the Indian Institute of Technology (IIT) Madras developed critical components for a highly efficient, cost-effective way to electrolyze seawater to generate hydrogen. Researchers optimised all the parameters so that water electrolyte could directly use photovoltaic-derived voltage and current density to split water and generate hydrogen. Researchers used a carbon-based support material for the electrodes instead of metals to almost eliminate the possibility of corrosion and also designed and developed transition metal-based catalysts that can catalyse both oxygen and hydrogen evolution reactions. The results were published in the journal ACS Applied Energy Materials.

## **CDSCO Approved 1st Indigenously Developed Animal-Derived Tissue Engineering Scaffold**

Central Drugs Standard Control Organisation (CDSCO), Govt. of India, approved the first indigenously developed tissue engineering scaffold from mammalian organs, that could rapidly heal skin wounds at low-cost with minimum scarring. With this, Sree Chitra Tirunal Institute for Medical Sciences & Technology (SCTIMST), an autonomous institution of DST, became the first institution in the country to develop Class D medical devices that satisfy all statutory requirements of CDSCO, Govt. of India.

## **Institute of Chemical Technology (ICT) Mumbai, Developed ICT-Poly Ujra Process to Bring Solutions for Plastic Pollution**

Researchers at the Institute of Chemical Technology (ICT) Mumbai developed a process called ICT-Poly Urja which uses indigenously prepared patented Cu@TiO<sub>2</sub> catalyst for CTL (Catalytic Thermo Liquefaction) of several types of poly-olefinic plastic waste into HC-Oil 300 C in 30 min. The process leads to more than 85% feedstock conversion, and high-quality C and H elements enriched HC-Oil with a calorific value of 42 MJ/kg. The fuel could be burned to generate steam and power. The Poly-Urja process developed with support from Department of Science and Technology (DST) provides a long-term, resilient, convenient, energy-efficient, and environmentally responsible method of transforming plastic waste into electricity.

## **Researchers Propose Novel Method to Prevent Droplet Breakage**

Researchers at the Centre for Nano Science and Engineering, Indian Institute of Science (IIS), Bangalore studied the droplet breakage on impact, affecting various day-to-day applications as it leads to undesired spots, reduced resolution in printing, and environmental pollution. Researchers examined particle-coated droplets and their behavior & found that droplets hit a surface, they could break apart, which is suboptimal for applications like printing or spraying. However, by coating droplets with tiny hydrophobic particles could prevent them from breaking. The findings also highlighted the importance of understanding the dynamics of particle-coated interfaces, which could have implications for fields like bioreactor design, digital microfluidics, self-cleaning technologies, and disease spreading in plants through pollen-laden drops.

## **Special Update: HPCL Undertook Successful Pilot Study on E27 Fuel & Ethanol Blended Diesel Fuel**

Under the aegis of Ministry of Petroleum & Natural Gas (MoP&NG), Hindustan Petroleum Corporation Limited (HPCL), successfully launched ground breaking pilot study on vehicles using E27 fuel and Ethanol Blended Diesel Fuel. With this HPCL became the first Oil Marketing Company in India to initiate such a comprehensive research program, in line with the "Roadmap for Ethanol Blending in India by 2025," which aims to promote the adoption of Ethanol Blending in gasoline. The pilot study of E27 fuel would focus on assessing its performance and emissions in engines and vehicles through extended mileage accumulation. Ethanol trials, in accordance with IS 1460:2017 fuel specifications, will also be conducted in conjunction with biodiesel- diesel.