



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*

## **Indian researchers developed composite materials for high temperature battery & supercapacitors**

Indian researchers at Birla Institute of Technology and Science (BITS) Pilani developed solid-state energy storage devices in the form of thermally stable solid electrolytes for Li<sup>+</sup> ion batteries and supercapacitors and tested their stability and efficiency using state of the art facilities. Researchers confirmed that this device promises application for a wide range of temperatures from 30-500 degrees Celsius. The research team used Dept. of Science and Technology (DST) FIST-supported High-temperature X-ray diffraction (HTXRD) facility Rigaku SmartLab and obtained XRD patterns in situ up to 500 C. The composite promises battery application for a wide range of temperature.

## **Indian scientists developed technique to use tea & banana waste to make non-toxic activated carbon**

Indian scientists from the Institute of Advanced Study in Science and Technology (IASST), Guwahati, an autonomous institute of the Department of Science & Technology, Govt. of India developed a technique by extracting oxygenated potassium compounds from banana which helped in activating the carbon to make non-toxic activated carbon. These non-toxic activated carbon can be used in industrial pollution control, water purification, food and beverage processing, and odour removal.

## **Researchers IICB developed Novel formulation for cost-effective and thermo-stable Insulin**

Researchers from Bose Institute, Council Of Scientific & Industrial Research - Indian Institute of Chemical Biology, (CSIR-IICB), Kolkata in collaboration with CSIR-Indian Institute of Chemical Technology (CSIR-IICT), Hyderabad developed a new formulation for thermo-stable, nontoxic and bioactive insulin, and shown that a small peptide molecule consists of four amino acids, named as "Insulock" prevents both heat and storage induced insulin fibrillation and thereby loss of effective quantum of insulin. The research has been published in iScience, an international reputed journal of Cell press.

## **Indian Scientists indigenously developed toxic-free and superior multilayer technology that packages together electronic components**

Indian Scientists from Materials Science & Technology Division, CSIR-National Institute for Interdisciplinary Science and Technology NIIST, under the purview of Advanced Manufacturing Techniques scheme of Dept of Science & Technology (DST), Govt. of India have indigenously developed toxic-free & superior multilayer technology (Low-Temperature Cofired Ceramic (LTCC) & High-Temperature Cofired Ceramic HTCC) that packages together electronic components like resistors, capacitors to produce multilayer circuits. Currently, India imports the LTCC products and therefore this indiginous development could plug the money drain and support the country's strategic sectors

## **Special Update: Indian Scientists developed a unique Laser-based Clad Coating Technology (LCCT)**

Indian scientists from International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), an autonomous institute of the Dept. of Science & Technology, Govt. of India developed a unique Laserbased Clad Coating Technology (LCCT) that provides adequate protection to the boiler parts ensuring life span improvement beyond two years. Scientists also confirmed that this technology is suitable, not only for boiler parts of thermal power plants but also for any engineering application involving high temperature erosive and corrosive environment. The patented LCCT has been successfully tested for feeder nozzle tips of boilers for 200 and 500 Megawatt of NTPC's thermal power plants at Farakka and Korba.