

CSIR in Media



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Indian scientists generate electricity from water sans using energy

Lab Covered: CSIR-NPL

18th December 2016

Soon, a device that runs on a few drops of water could revolutionise the way electricity is generated, thanks to a team of scientists at Delhi's National Physical Laboratory (NPL).

Researchers have developed a novel way of producing electricity from water at room temperature without using any power or chemicals. The device named, Hydroelectric Cell, generates electricity using nothing except a few drops of water.

Chief Scientist Dr R. K. Kotnala and his research partner Dr Jyoti Shah of NPL have demonstrated that this panel can generate up to about a quarter ampere current at a little less than one volt.

They used Nanoporous Magnesium Ferrite to split the water into Hydronium (H_3O) and Hydroxide (OH) ions spontaneously, silver and zinc as electrodes to make a cell that produces electricity. The hydroelectric cell that uses magnesium ferrite of 1 sq. inch size produces 8 mA current and 0.98 volt.

According to a paper published in the International Journal of Energy Research, magnesium ferrite of 2-inch diameter produces 82 mA current and 0.9 volt. Now, the hydroelectric cell material design has been improved and a 2-inch diameter material generates 150 mA current and 0.9V.

When we connect four cells [of 2-inch diameter] in series the voltage increase to 3.70 volts and we can operate a small plastic fan or a LED light of 1 watt," said Kotnala, adding, "At a stretch, we can operate the LED for one week as zinc hydroxide, which forms at the anode, gets into the nanopores of Magnesium Ferrite and reduces its activity."

Since magnesium has high affinity for Hydroxide, it spontaneously splits or dissociates water into Hydronium and Hydroxide ions. The Hydronium ions gets trapped inside the nanopores of Magnesium Ferrite and generates an electric field. The electric field helps in further dissociation of water.

This device is much economical than solar panel, may revolutionise the energy generation scenario. The device has already been patented and published in an international journal. The efforts are on to shape it in a convenient form like dry cell and to improve in terms of longevity and electrical contacts, said the scientists.

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Business Standard **Source: bit.ly/2h1eVK5**

Also Published in:

New Indian Express **Source: bit.ly/2hYsrzY**

Economic Times **Source: bit.ly/2hhwfs5**

Punjab Kesari **New Delhi, Page 13, 17th December, 2016**

Government to come out with new grading system for scientists

Lab Covered: CSIR-NPL

19th December 2016

'Calibrate gadget periodically for pollution data'

Vishwa.Mohan
@timesgroup.com

New Delhi: Admitting that most pollution measuring equipment in the country were "not calibrated as per standards which in turn affected the quality of the measured data", the government has asked pollution watchdogs CPCB and SPCBs to get their instruments calibrated periodically.

The government has also tasked an agency which specialises in calibrating biomedical machines to maintain accuracy of its instruments.



Once all pollution measuring instruments are calibrated, users will get uniform results

tion of pollution measuring and biomedical equipment). "CSIR-NPL has established a primary ozone calibration facility which is being used by different organisations for calibrating their ozone analysers used for monitoring ambi-

Since calibration is the process of configuring an instrument to provide uniform result for a particular sample, it is done keeping in view geographical location and general climatic condition. Though biomedical equipment follow Bureau of Indian Standards parameters, there is no uniformity in the sector due to absence of mandatory calibrations.

Admitting the problem due to non-calibration of such equipment, the government had told Parliament on Wednesday that National Physical Laboratory of the Council of Scientific and Industrial Research has initiated a programme to cater to this "national need" (calibra-

ent ozone concentrations," minister of state for science and technology Y S Chowdary had said in his written response to a Parliament question.

He added, "CSIR-NPL is also calibrating biomedical equipment like clinical thermometer and (MRI) machines for calibration of temperature and magnetic field, respectively." **TOI** had reported the matter in September when CSIR-NPL had flagged the issue, highlighting the current use of non-calibrated instruments.

Once all such instruments are calibrated, users will get accurate and uniform results even if they use machines of different manufacturers.

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Cashiers catch a cold in season of old notes

Lab Covered: CSIR-IGIB

18th December 2016

Tarini Puri

Cash is king, but it can also be sickening. A middle-aged woman cashier working with a nationalised bank on Dhole Patil Road learned this the hard way.

Soon after the demonetised currency notes started trickling into her bank branch, the cashier acquired an allergic cough that multiple visits to her doctors and fistful of pills simply failed to cure.

The symptoms, in fact, aggravated every time she sat down at her counter to count the currency notes being deposited by citizens through the day. After three weeks of suffering, her family physician finally arrived to the conclusion that the exposure to the musty smell and dust on the currency notes is the prime reason for her ailment.

However, with the banks getting stingy with leaves to tide over the deposit rush, the Kothrud-resident said "her recovery has been slow and frustrating".

A recent study undertaken to evaluate common currency notes as potential carriers of microbes and infectious agents found the presence of 78 pathogens and 75 cellulose degrading organisms on banknotes. Additionally, 78 antibiotic resistance genes were identified, of which 18 were found in all the samples. Furthermore, six out of the 78 pathogens harboured at least one of the 18 common antibiotic resistance genes.

The study was conducted by PhD students of Delhi-based Council of Scientific and Industrial Research - Institute of Genomics & Integrative Biology (CSIR-IGIB).

As per doctors, this danger is enhanced by the prevailing changing-weather conditions, lowered immunity due to stress and work overload. It is further compounded by many unwell citizens also standing in queues to deposit cash before the last date.

Family physician Sarang Phadke said, "There is definitely an increase in the number of bankers falling sick and I am getting more than usual cases of people working in banks. Allergic reactions are common because of old notes or the rubber getting stuck on these."

While all the bankers that TOI contacted regarding the matter refused to come on record. They, however, admitted to the knowledge of the risks involved in handling too many currency notes.

Sharing details of the risk they face, a branch manager of a nationalized bank said, "We are aware that people even spray their stashed cash with pesticides and other such chemicals to ward off insects. However, we have not dealt with such a severe case at our branch. I keep telling my staff to eat healthy food and exercise daily to stay fit."

Manager at another nationalized bank said, "One of our tellers did fall sick in the initial days of the demonetization drive and was on leave too. But he is back now and is coping well. We have no other option, but to carry on with our jobs".

Sunil Paigude, past president of Pune's General Practitioners Association (GPA) said, "Co-relation between increasing cases of bankers falling sick and their increased handling of old currency notes can definitely be done as storage can give rise to infections. Washing hands regularly, using masks and ensuring over-all cleanliness can keep such cashiers safe".

Medical experts said sneezing and itching of the eyes are likely common complaints in such cases. Sanjay Wagh, president of GPA, Pune said, "Infection-carrying customers are also likely to just pass on their infections to bankers through touch of hand or by unknowingly planting the infection on the notes. It's ironic that many bankers don't even have the time to visit a doctor."

Rupa Agarwal, another city-based physician, said, "A lot of banker patients have come to me in the past few days. Rashes on the face and allergic reactions without any history of it made me instantly co-relate it with their overwork and excessive handling of currency notes. Infections easily transfer through saliva commonly used to count notes. People should be more conscious of hand hygiene."

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Source: bit.ly/2hQp8Y7

Hyderabad research hubs lead the pathway to new drug discoveries

Lab Covered: CSIR-CCMB, CSIR-IICT

18th December 2016

India is one of the biggest producers and exporters of generics in the world, but it has a rather abysmal record in discovery of new drugs and developing new chemical entities. The dearth of initiatives in research and development activities though appalling is not surprising considering the fact that a majority of the drugs produced in the country are replicas of off-patent drugs which could legally be reproduced.

Indian generic drug manufacturers have a big assured market in the USA and Europe. While it cannot be denied that large scale production of generics has given people of the country access to low cost and affordable drugs compared to their branded versions, the lack of initiatives, especially on the part of the big pharma players is inexplicable. The biggies who rake in huge revenues usually cite financial constraints as the reason for their not being able to afford R&D investments.

This being the case with the private pharma players, especially in Hyderabad, which is considered as the pharma capital of India, a major contribution towards new drug discoveries is coming from premier public sector research institutions. And, significantly most of these developments related to medicare are emanating from Hyderabad-based institutions like the Centre for Cellular and Molecular Biology (CCMB), Indian Institute of Chemical Technology and the Indian Immunologicals Limited.

The CCMB which is working on a gamut of game changing technologies from nanotechnologies for medical applications to stem cell therapies, have in their repertoire crucial breakthroughs, one among the many innovations the DNA based eye diagnostic chip that could enable the detection and identification of pathogens that cause eye infections. One among them is the development of DNA based eye diagnostic chip to detect and identify pathogens that cause eye infections.

Another, exciting development happening at the CCMB, which in the near future will provide solutions to an extensive range of health problems, is the creation of nano particles – labeled as the magic bullets - for drug delivery. These particles are programmed to deliver drugs at the exact location of the problem site, i.e.at the infected cell. Another amazing possibility is its application to treat cancer. The particles will identify the cancer cells, bind with them and release the drug. This drug delivery platform has proved to be effective in treating ophthalmic applications, specifically Fungal Keratitis – an inflammation of the eye's cornea.

The Indian Institute of Technology (IIT) also has a productive track record in the area of new drug discovery and also developing affordable substitutes of essential drugs for HIV and asthma with the latest being the breakthrough in coming out with a drug to combat multi-drug resistant tuberculosis. In addition to these, two more drugs against cancer is also in the pipeline,

Indian Immunologicals (IIL) has carved a niche in the vaccines segment with around eleven vaccines, including those against Hepatitis, Chikungunya, Japanese Encephalitis, Pneumonia, Typhoid and Rabies in advance stage of development, All these institutions have proved to be beehives of innovations and demonstrated the pathways for drug discoveries. With such proven credentials, Hyderabad has the potential to become the nerve-centre of new drug discoveries in India

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Lab Covered: CSIR-CEERI

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Int'l conf on computers concludes at BITS-Pilani

DNA correspondent@jaipurdna

The 8th international conference on Intelligent Human-Computer Interaction Conference (IHCI-2016), collectively organized by BITS-Pilani, CSIR-CEERI and IIT Allahabad, concluded at BITS-Pilani and CSIR-CEERI, Pilani.

IHCI is a forum brings together engineers and scientists from around the world on a common platform to present researches done on human-computer interaction, artificial intelligence, signal processing and computer vision. The conference has been organised since 8 years to develop awareness and interest of younger generation about the same.

It was a two day long conference held on 12 -13 December, wherein researchers submitted their papers . Day two began with the talk by associate vice president of university of Southern Florida, USA. The session was chaired by prof Anupam Basu, IIT Kharagpur.

This year a total of 119 papers were submitted, out of which 29 have been accepted for presenta-

tion. The inauguration ceremony of the event started with Saraswati Vandana, followed by the lighting of the lamp by director of CSIR-CEERI, Prof. Santanu Chaudhary, vice chancellor of BITS-Pilani, Prof Souvik Bhattacharyya and the chief guest, Prof. Manas Mandal.

The theme of the conference was introduced by Prof. Anupam Basu, CSE department, IIT Kharagpur. Prof Santanu Chaudhary highlighted the inter-disciplinary aspect of the conference and Prof Souvik Bhattacharyya talked about the distinguishing features of BITS-Pilani and the unique blend of tradition and modernism inherent to Pilani.

The chief guest, Dr Manas K Mandal discussed the general aspects of a conference and what an attendee should seek while attending a conference. He showed his enthusiasm to attend and learn from this particular conference. The ceremony was concluded with a vote of thanks by Dr Yashvardhan Sharma, co-convener of IHCI-2016.

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Lab Covered: CSIR-CEERI

14th December 2016

तीन तकनीकी सत्रों में 17 ने शोध पत्र प्रस्तुत किए

भास्कर न्यूज | पिलानी

सीएसआईआर-सीरी पिलानी, बिट्स पिलानी व आईआईटी इलाहाबाद के संयुक्त तत्वावधान में बिट्स परिसर में अंतरराष्ट्रीय सम्मेलन में पहले दिन तीन सत्रों में 17 शोध पत्र प्रस्तुत किए गए। प्रबुद्ध मानव-कंप्यूटर अंतःक्रिया विषय पर आठवें अंतरराष्ट्रीय सम्मेलन के दौरान आईआईटी खड़गपुर के प्रो. अनुपम वासु की अध्यक्षता में हुए तकनीकी सत्र में युनिवर्सिटी ऑफ सदर्न फ्लोरिडा यूएसए के एसोसिएट वीसी प्रो. सुदीप सरकार ने विडिया इवेंट अंडरस्टैंडिंग विद पैटर्न थियरी विषय पर प्रस्तुत प्लेनरी वार्ता हुई। बिट्स के प्रो. चंद्रशेखर की अध्यक्षता में हुए सत्र के दौरान लतिका केएस ने ग्राफ बेस्ड क्लस्टरिंग फोर एपिक्टोरियल जिम्सां पजल्स ऑफ हेंड सेडेड कंटेंट-लेस पेजेज विषय पर, जयश्री फनसारे ने 2-डी जेस्चर फोर न्यूमैरिक देवनागरी साइन लेंग्वेज एनालाइजर



पिलानी, सीरी में कार्यक्रम में उपस्थित प्रतिभागी।

वेस्ड ऑन टू कैमराज विषय पर, अर्पणा सैन ने स्टडी ऑफ इंजीनियर्ड फीचर्स एंड लर्निंग फीचर्स इन मशीन लर्निंग- ए केस स्टडी इन डोक्यूमेंट क्लासिफिकेशन विषय पर, प्रेम सी पांडे ने इंप्लिमेंटेशन ऑफ ए डिजिटल हीयरिंग एड विद यूजर-सेट्टेबल फ्रीक्वेंसी रेस्पॉस एंड स्लाइडिंग-बैंड डायनेमिक रेन्ज कंप्रेशन एज

ए स्माटटफोन ऐप विषय पर, अंकिता सिंह ने हेंड्स अप- टू असेस युअर सस्टेंड फिटनेस विषय पर तथा सोनिया शर्मा ने ए वोटिंग- बेस्ड सेंसर फ्यूजन अप्रोच फोर हामेन प्रेजेंस डिटेक्शन विषय पर अपने शोध पत्र प्रस्तुत किए। आईआईटी इलाहाबाद के प्रो. यूएस तिवारी की अध्यक्षता में हुए तकनीकी सत्र में शृभांगी

शर्मा, श्रीजा एसआर, स्नेहा सहरावत, अशोक बंधोपाध्याय व उपासना तालुकदार ने तथा अमृता विश्वविद्यालय के प्रो. टीएसवी सुदर्शन की अध्यक्षता में हुए तकनीकी सत्र के दौरान मिल्वन लोबो, जयश्री वाजपेयी, कल्पना सागर, अलका सिंघल, मीरा खन्ना व योको बडियांतो सेत्योहाडी ने अपने-अपने शोध पत्र प्रस्तुत किए। तकनीकी सत्रों के बाद हुई पैनल चर्चा के दौरान आईआईटी खड़गपुर के प्रो. अनुपम वासु, सीरी निदेशक प्रो. शांतनु चौधुरी, आईआईटी मद्रास के प्रो. सुखेंदु दास व युनिवर्सिटी ऑफ सदर्न फ्लोरिडा यूएसए के प्रो. सुदीप सरकार ने भाग लिया। अंत में बिट्स निदेशक प्रो. एके सरकार ने प्रतिभागियों को प्रमाण पत्र वितरित किए। सहसंयोजक डॉ. यशवर्धन शर्मा ने आभार व्यक्त किया। सम्मेलन के दौरान आयोजित सांस्कृतिक संध्या के दौरान अलंकार म्यूजिकल ग्रुप के कलाकारों ने लोकनृत्यों की प्रस्तुति दी। संचालन फंज गोस्वामी ने किया।

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Dainik Navjyoti, Page 5, 13th December 2016

Jaipur Times, 13th December 2016

Rajasthan Patrika (Jhunjhunu), 13th, 14th December

Atmospheric moisture transport on a global scale

Lab Covered: NIO

18th December 2016

Atmospheric rivers and low-level jets are important mechanisms by which water is transported in the atmosphere. Atmospheric rivers (AR) carry 90 per cent of ocean moisture transported to the mid-latitudes. Similarly, most of the moisture transported from ocean to land in the tropics is via low-level jets (LLJ). A recent global study has confirmed that these phenomena play a major role in the occurrence of extreme rainfall events, and their absence leads to droughts.

One of the important findings of the study is that both these phenomena would play an important role in future climate scenario as well as in affecting the highly sensitive regions such as the Arctic and Antarctic. The study was published recently in the Annual Review of Environment and Resources.

For example, a more intense South American low-level jet in a warming climate suggests an increased transport of moisture from the north to southeast of the Andes and an increase in the frequency of rainfall extremes in south-eastern South America.

“Atmospheric rivers carry an amount of water vapour roughly equivalent to the average flow of water at the mouth of the Mississippi River,” says Dr. M.R. Ramesh Kumar from the Physical Oceanography Division, National Institute of Oceanography, Goa, and a co-author of the paper.

When ARs make a landfall, they often release water vapour in the form of rain or snow. Those that contain the largest amounts of water vapour and the strongest winds can create extreme rainfall and floods. These events can disrupt travel, induce mudslides and cause catastrophic damage to life and property.

Not all ARs cause damage; most are weak systems that often provide beneficial rain or snow that is crucial to water supply. A detailed study of moisture transport could provide a better understanding of observed changes and enable projections of future climates. Such studies could lead to better rainfall forecasts in monsoon regions and throw light on the role of transport of moisture in intense rainfall events and droughts.

While rainfall from LLJs occurs mostly in summer, ARs can produce rainfall in winters too. Atmospheric Rivers are 1–2.5 km in high and 300–500 km wide plumes of winds with high water vapour content, stretching over distances of at least 2,000 km. A LLJ is a region of relatively strong wind in the lower part of the atmosphere. It can be several thousand kilometres long, a few hundred kilometres wide and a few thousand metres in depth. While AR is mostly an extra-tropical phenomenon, LLJs can occur in both tropical and extra tropical regions.

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Source: bit.ly/2hZ340I

Lab Covered: CSIR-CIMFR

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पर्वत पर लटके 'मौत के दूत' से मुक्ति

गया के ब्रह्मयोनी पर्वत पर लटकी विशालकाय चट्टान को सिंफर वैज्ञानिकों ने किया धराशायी

जागरण संवाददाता, धनबाद : ब्रह्मयोनी पर्वत... ऐतिहासिक धरोहर को समेटे खड़ा यह वही पर्वत है जहां शांतिदूत गौतम बुद्ध ने आदित्य पर्याय सूत्र का उपदेश दिया था। मौजूदा दौर में तेजी से हो रहे विकास का बोझ उठा पाने में इस पर्वत की चट्टान लड़खड़ा रही थी। गिहायशी इलाके के लिए ऐसी चट्टान मौत का दूत से कम न थी। गया के दक्षिण-मध्य इलाके में रहने वालों के लिए वृहद आकार की चट्टानों के फिसलने की सूचना के बाद आसपास के लोगों का जीवन संकट में था। विचार सरकार ने इस संकट से उबारने के लिए धनबाद के केंद्रीय खनन एवं ईंधन अनुसंधान संस्थान (सिंफर) से सहयोग मांगा। तकरीबन तीन महीने तक चले ऑपरेशन के बाद शक्रवार को तीसरे ब्लास्ट के साथ ही वैज्ञानिकों की टीम ने इस चट्टान से लोगों को मुक्ति दिला दी।

सिंफर के ब्लास्टिंग विभाग की टीम ने दिया अंजाम >>17

वैज्ञानिक तकनीक से धमाके के कारण नहीं छिटके छोटे पत्थरों के टुकड़े



विस्फोट के बाद चट्टान के आसपास फैला धुआं। जागरण

सिंफर निदेशक के नेतृत्व में चला ऑपरेशन

सिंफर निदेशक डॉ. पीके सिंह के नेतृत्व में तीन महीने तक ऑपरेशन चला। संस्थान के वैज्ञानिक पिछले तीन महीने से पर्वत से लटकी चट्टान की मॉनीटरिंग कर रहे थे। ब्लास्टिंग विभाग प्रमुख डॉ. पी पील रॉय ने अपनी टीम के साथ साइट का दौरा भी किया। घटनास्थल घनी आबादी के समीप होने के कारण पूरी सतर्कता बरती गई। भारी भरकम चट्टान धमाके के साथ तोड़ी गयी। वैज्ञानिक तकनीक से हुए धमाके की वजह से पत्थरों के छोटे टुकड़े छिटकने जैसी कोई घटना नहीं हुई।

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Dainik Jagran