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Outlook

Tue, 17 Aug 2021

No immediate danger as Chenab blockade cleared naturally

Central Water Commission (CWC) has ruled-out any imminent danger in a report filed after site visit

By Ashwani Sharma

A high level team led by Director Central Water Commission (CWC) NN Rai, which visited the landslide site at Lahaul-Spiti on Sunday has ruled-out imminent danger to the local villages, land and properties.

Chief Secretary of Himachal, Ramsubhag Singh told *Outlook* on Monday morning that more than 50% of the blockade caused by the massive landslide has cleared naturally. The river flow is expected to normalize soon, without intervention.

“We have found that more than 50% of the blockage has already got removed naturally by the river. The velocity of flow at the blockage location is in the range. A natural bench of about 20m width and about 45-50m length has formed which will provide space to accommodate the material falling due to further land slide” the CWC report said..



The team was asked to study the impact of the landslide on the local ecology.

The report further said, “The concave shape of the sliding plain shall also provide some space to accommodate the further sliding material. Hence, further blockage of the river in case of landslide at the same location is unlikely.”

Beside Rai, other members of the team included Rohit Sharma (Central Water Commission, Shimla), Col Arun (Indian Army), Sandeep Kumar Rawal, Inspector, National Disaster Response and senior officials of the state government and district administration from Lahaul-Spiti. “The situation seems to be normal at present, however the administration needs to be watchful of further slides” Ramsubhag Singh said.

Meanwhile a team of experts from the Defence Geoinformatics Research Establishment, Chandigarh has also decided to visit Lahaul-Spiti and is likely to reach on Tuesday. Meanwhile, a team of the engineering wing of the Army reached Lahaul and it would visit the landslide site.

Deputy Commissioner, Lahaul-Spiti, Neeraj Kumar said that the flow of the Chenab has normalised. “We are preparing a contingency plan as part of the disaster mitigation and response,” he said. Meanwhile in Kinnaur, the research operation continues at Nigulsari even as nobody was recovered in the past 24 hours.

Special Secretary State Disaster Management Authority (SDMA) Sudesh Mokta said, "Till now, 23 bodies have been recovered and handed over following postmortem, 13 persons have been saved and search operations will be in progress.”

<https://www.outlookindia.com/website/story/india-news-no-immediate-danger-as-chenab-blockade-cleared-naturally/391647>

Greater Kashmir

Tue, 17 Aug 2021

GMC Kathua gets Oxygen Plant under PM Care Fund

Rs 35.89 lakh worth medical equipment under MPLAD fund Union MoS Dr Jitendra Singh inaugurates facility, discusses development issues

Kathua: Union Minister of State for Development of North Eastern Region and PMO, Dr Jitendra Singh on Monday said that Government of India has taken numerous steps to augment medical infrastructure in healthcare institutions of Jammu & Kashmir to deal with the challenges like Covid-19 and other medical situations.

He said this after inaugurating 1000 LPM capacity Oxygen Generation Plant at Government Medical College, Kathua.



Pertinently, the newly installed Oxygen Generation Plant has been installed under PM Care initiative. The DRDO, NHAI, PWD and Mechanical Engineering Department were roped in to install the Plant in the shortest possible time.

With the addition of 1000 LPM Plant, the total Oxygen Generation Capacity in GMC Kathua has gone up to 3250 LPM.

The Union Minister also dedicated a portable Ultrasound Machine and two CBC analysers worth Rs 35.89 lakh provided under his MPLAD fund.

Dr Jitendra also inspected the Covid Vaccination Centre and interacted with people and nursing staff deputed to undertake the age appropriate inoculation drive at GMC Kathua

The Union Minister said Jammu & Kashmir has taken lead in Covid vaccination and it has become possible with the dedication of the medical staff who are reaching out to people braving all odds. He directed Principal GMC to incentivise those staff members who register lowest wastage of Covid Vaccines.

Dr Jitendra also distributed ration among the beneficiaries of Prime Minister Garib Kalyan Yojna(PMGKY) at Hatli Morh.

Speaking on the occasion, Dr Singh said the initiative of providing free ration to the identified group of people adversely affected by the Covid situation has been worked out with the vision of Prime Minister Narendra Modi and is being extended till October this year.

Dr Jitendra Singh also chaired a meeting with elected representatives of PRIs, ULB's and officers of the district administration at the conference hall of DC office complex.

DDC Chairman, Kathua Mahan Singh put forth development issues before the Union Minister which were related to the early completion of key roads, revised payment of border bunkers, tapping of tourism potential areas of the district.

Vice Chairman, DDC, Raghunandan Singh and other elected members highlighted development related issues of their respective areas.

Dr Jitendra Singh assured that necessary intervention required for taking up the issues of the elected members with concerned authorities will be ensured. He appealed to the PRI and ULB

members to keep close liaison with the officers of district administration to remove any bottlenecks hampering development schemes.

<https://www.greaterkashmir.com/todays-paper/health-todays-paper/gmc-kathua-gets-oxygen-plant-under-pm-care-fund>

अमर उजाला

Tue, 17 Aug 2021

जीएमसी की ऑक्सीजन उत्पादन क्षमता 3250 एलपीएम तक बढ़ी

कठुआ: पीएम केयर के अंतर्गत जीएमसी कठुआ में एक हजार एलपीएम क्षमता के ऑक्सीजन उत्पादन प्लांट का केंद्रीय मंत्री डॉ. जितेंद्र सिंह ने उद्घाटन किया। इसके साथ ही जीएमसी में ऑक्सीजन उत्पादन की क्षमता बढ़कर 3250 एलपीएम हो गई है।

डॉ. जितेंद्र सिंह ने कहा कि तीन महीनों के भीतर ही कठुआ जीएमसी ऑक्सीजन की शून्य उत्पादन क्षमता से 3250 एलपीएम क्षमता तक पहुंच गया है। कोरोना जैसी चुनौतियों से निपटने के लिए अब पर्याप्त इंतजाम हैं। इस संयंत्र को पूरा करने के लिए डीआरडीओ, एनएचएआई, लोक निर्माण विभाग और मैकेनिकल इंजीनियरिंग विभाग को शामिल किया गया था।



जीएमसी कठुआ में नए आक्सीजन प्लांट का उद्घाटन करते केंद्रीय राज्यमंत्री डॉ. जितेंद्र सिंह, संवाद? - फोटो : KATHUA

केंद्रीय मंत्री ने सांसद निधि से 35.89 लाख रुपये पोर्टेबल अल्ट्रासाउंड मशीन और दो सीबीसी विश्लेषक के लिए समर्पित किया। कार्यक्रम के दौरान उन्होंने जीएमसी में कोविड टीकाकरण केंद्र का निरीक्षण किया। उन्होंने जीएमसी प्रधानाचार्य को निर्देश दिए कि टीके की कम से कम बर्बादी सुनिश्चित करने वाले स्टाफ को प्रोत्साहित करें। उन्होंने जीएमसी के सहायक अस्पताल में आईसीयू की भी जानकारी ली। इसके बाद हटली मोड़ में केंद्रीय मंत्री ने प्रधानमंत्री गरीब कल्याण योजना के लाभार्थियों को राशन बांटा।

जिला सचिवालय में की बैठक

केंद्रीय राज्य मंत्री डॉ. जितेंद्र सिंह ने कठुआ दौरे के दौरान जिला सचिवालय में पंचायत, निकाय प्रतिनिधियों और जिला प्रशासन के साथ बैठक की। इस दौरान प्रतिनिधियों ने केंद्रीय मंत्री के सामने प्रमुख सड़कों के जल्द पूरा होने, सीमा बंकरों के संशोधित भुगतान, जिले के पर्यटन संभावित क्षेत्रों को विकसित करने जैसे मुद्दों को रखा। डॉ. जितेंद्र सिंह ने आश्वासन दिया कि निर्वाचित सदस्यों के मुद्दों को संबंधित अधिकारियों के हस्तक्षेप से हल किया जाएगा। उन्होंने पंचायती राज संस्थाओं और निकाय सदस्यों से अपील की कि परियोजनाओं में किसी भी तरह की रुकावट को कम करने के लिए बिना विलंब जिला प्रशासन के अधिकारियों से संपर्क बनाएं।

<https://www.amarujala.com/jammu-and-kashmir/kathua/inauguration-of-oxizen-plan-in-gmc-kathua-kathua-news-jmu2416773190>

Defence Strategic: National/International



Press Information Bureau
Government of India

Ministry of Defence

Mon, 16 Aug 2021 3:39PM

Defence testing infrastructure scheme

Key Highlights:

- *Scheme to boost domestic defence & aerospace manufacturing*
- *Rs 400 crore outlay to create state-of-the-art testing infrastructure in partnership with industry*
- *Scheme was launched by RM in May 2020*
- *Project consultant/officer can be contacted for clarification*

In order to boost domestic defence and aerospace manufacturing, Ministry of Defence (MoD) has launched Defence Testing Infrastructure Scheme (DTIS) with an outlay of Rs 400 crore for creating state-of-the-art testing infrastructure in partnership with the private industry. The scheme was launched by Raksha Mantri Shri Rajnath Singh on May 08, 2020. The scheme would run for the duration of five years and envisages setting up of 6-8 Greenfield Defence Testing Infrastructure facilities that are required for defence and aerospace related production.

The projects under the scheme will be provided with up to 75 per cent Government funding in the form of 'Grant-in-Aid'. The remaining 25 per cent of the project cost will have to be borne by the Special Purpose Vehicle (SPV) constituents of which will be the Indian private entities and state governments. In this regard, Department of Defence Production/Directorate General of Quality Assurance (DDP/DGQA) has published eight Expression of Interest (EOIs) catering to setting up of defence test facilities in selected domains. The same has been uploaded on <https://eprocure.gov.in> and <https://ddpmod.gov.in>. The Request for Proposal (RFP) for the defence test facility for selected aid domains will be issued shortly and published on the above websites.

A project consultant for the scheme has been hired, who can be contacted on email id vishal.kanwar@pwc.com, shruti.arora@pwc.com and project officer from DDP/DGQA can be contacted on email: dtis-dqawp@navy.gov.in and ks.nehra@navy.gov.in for any clarification on the scheme, EOI or RFP terms and conditions.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1746365>

Indian Coast Guard inducts 3 indigenously-built advanced light helicopters MK-III

The helicopters which are part of the ALH MK-III programme will be positioned at four Coast Guard squadrons at Bhubaneswar, Porbandar, Kochi and Chennai.

New Delhi: In a major boost to the ALH MK-III indigenous Coast Guard programme, three Advanced Light helicopters (ALHs) manufactured by HAL were inducted into the stables of the Indian Coast Guard by Defence Secretary Dr Ajay Kumar on Monday.

The helicopters will assist in search and rescue operations, and further enhance coastal security.

The Central government-run Hindustan Aeronautics Limited (HAL) - which has designed and developed the ALH MK-III - will supply 16 of these helicopters to the ICG by mid-2022, according to the Ministry of Defence (MoD).

Earlier in June, the ICG had inducted the first three helicopters and with these, a total of 6 ALH MK-III have been received by the coast guards so far.

"On induction, (all) the 16 ALH MK-III will be positioned at four ICG squadrons at Bhubaneswar, Porbandar, Kochi and Chennai," the MoD had earlier stated in a statement.

It had further stated that the shared maritime boundaries with littoral states are highly susceptible to illegal activities and the regions are prone to frequent cyclones.

These ALH MK-III squadrons with embarked operations will ensure seamless surveillance and provide assistance to fishermen in distress at sea, it added.

The helicopters are equipped with state-of-the-art equipment like Surveillance Radar, Electro-Optic Pod, Medical Intensive Care Unit, High-intensity Search Light, SAR Homer, Loud Hailer, Machine Gun and can perform other key roles.

Helicopter MRO Division is the nodal agency for execution of PBL contract along with Engine Division and other Sister Divisions of HAL.

<https://www.timesnownews.com/india/article/indian-coast-guard-inducts-3-indigenously-built-advanced-light-helicopters-mk-iii/799776>



Indian Coast Guard inducts ALH MK-III | Photo Credit: ANI

India and Qatar conduct joint naval exercise in Persian Gulf

The second edition of the joint naval exercise, Zair-Al-Bahr, between the Indian Navy and Qatar Emiri Naval Force (QENF) was conducted between August 9 and 14 in the Persian Gulf
By Abhishek Bhalla

New Delhi: The second edition of the joint naval exercise, Zair-Al-Bahr, between the Indian Navy and Qatar Emiri Naval Force (QENF) was conducted between August 9 and 14 in the Persian Gulf.

This edition of the exercise included a three-day harbour phase followed by a two-day sea phase. The sea phase comprised of tactical maritime exercises involving surface action, anti-piracy exercises, air defence, maritime surveillance, boarding operations and SAR exercises.

In the sea phase of the exercise, the Indian Navy's Stealth Frigate INS Trikand, QENF's missile boats of Barzan and Damsah class, fast-attack crafts of MRTP 34 class and Rafale fighter aircraft participated.



The second edition of the joint naval exercise, Zair-Al-Bahr, between the Indian Navy and Qatar Emiri Naval Force (QENF) was conducted between August 9 and 14 in the Persian Gulf. (Photo: Twitter)

"The Indian Navy remains committed towards ensuring peace, stability and security in the region and is ever-ready to cooperate and collaborate with partner navies on issues of maritime safety and security," the Indian Navy said in a statement.

"The second edition of exercise Zair-Al-Bahr will contribute towards the Indian Navy's efforts to consolidate inter-operability and forge strong bonds of friendship with the Qatari Navy. The bilateral maritime exercise between the two navies will further strengthen the maritime exchanges between the two countries and enhance maritime security in the region," the statement added.

<https://www.indiatoday.in/india/story/india-qatar-conduct-joint-naval-exercise-persian-gulf-1841717-2021-08-17>

China PLA allegedly building ICBM Silo Site: Researcher

By Hercules Reyes

The People's Liberation Army (PLA) is currently building a new missile silo site, according to the US Air Force's China Aerospace Studies Institute.

Research director Roderick Lee mentioned in his report that the PLA "likely began construction" of a potential intercontinental ballistic missile (ICBM) silo site in Hanggin Banner, Ordos City, Inner Mongolia.

The coordinates of the alleged missile silo site have been supported by corroborating images from the European Space Agency's Sentinel-2 mission.

The images, taken between May 16 and August 9, 2021, show a construction footprint similar to those found at known PLA ICBM silo construction sites at Jilantai, Guazhou (typically referred to as the Yumen site), and Hami.



A Chinese DF-21D missile is driven past an image of the Great Wall of China. The country is now developing a laser device that could improve the speed of hypersonic missiles and aircraft, Photo: Greg Baker/AFP

Secret Missile Silo Site?

What makes this alleged silo site near Hanggin Banner secret is that there is currently no public knowledge of the existence of such a facility in the area. This is unlike the Guazhou ICBM silo site that is publicly known.

Although the only available images were satellite images, the report mentioned that "the similarities in construction footprint in terms of spacing, excavation patterns, and use of dome shelters, as well as the general trend of rapid growth in PLA Rocket Force (PLARF) fixed systems suggest that the construction site at Hanggin Banner is likely an ICBM silo site."

Images that were taken by a Sentinel-2 on August 9, 2021, showed at least 29 possible silo construction sites. The alleged sites were divided into two "clusters"—one northern and one southern cluster.

China's Missile Development Efforts

China has ramped up its missile technology development recently, with a number of publicized exercises and testing done this year.

In May, the Chinese air force tested an upgraded version of its HQ-9 air-defense missile system.

Also in May, a hypersonic missile was unveiled to the public during the 18th National Science and Technology Week in Beijing.

In July, it was reported that a team of laser experts at Beijing's Space Engineering University is developing a device to further increase the speed of hypersonic missiles and military aircraft.

<https://www.thedefensepost.com/2021/08/16/china-icbm-silo-site/>

'Significant success' | Chandrayaan-2 discovery: ISRO's orbiter confirms earlier finding of water on Moon surface

Chandrayaan 2, ISRO orbiter has validated the findings of India's Chandrayaan-1 mission regarding the presence of water molecules on the Moon's Lunar surface

By Bhavyata Kagrana

In a significant discovery, the Indian Space Research Organisation's (ISRO) Chandrayaan-2 validated the presence of water on the moon's surface. According to scientific experts, this will open gates of immense opportunities for future lunar exploration. In an interview with Zee Media, Dr. Mylswamy Annadurai, Former Director of ISRO's UR Rao Satellite said that 'the data from the old M3 sensor and the new Chandrayaan 2 sensor have matched. The orbiter of Chandrayaan 2 has a 5 micron (wider spectrometer), hence it unambiguously confirms the findings of Chandrayaan-1'. Similar confirmations were made earlier by the Imaging infrared spectrometer (IRS) instrument regarding the presence of hydroxyl as well as water molecules on the lunar surface.

Meanwhile, the NASA-provided Moon Mineralogy Mapper (M3) experiment carried on Chandrayaan-1 spacecraft had also detected evidence for water at lunar poles, however, a hundred percent confirmation was still required. The basic function of a Spectrometer is to take in light(reflected from a surface) and provide a graph of the output. However, in the case of the M3, its wavelength of 0.7 to 3 microns was not sufficient to ascertain and affirm the detection of water on the moon.

Chandrayaan-2 mission

Chandrayaan-2 predecessor, Chandrayaan-1, was launched in 2008 that discovered the presence of water molecules on the parched lunar surface. While the Chandrayaan-2 mission was designed to expand the lunar scientific knowledge through a detailed study of topography, seismography, mineral identification and distribution, surface chemical composition, thermo-physical characteristics of topsoil, and composition of the tenuous lunar atmosphere, leading to a new understanding of the origin and evolution of the Moon.

The \$150 million dollars highly complex mission consisted of an orbiter, lander, and rover to explore the unexplored South Pole of the Moon.

Chandrayaan-2 mission- How it started?

Chandrayaan-2 was launched on July 22, 2019, and on September 6, the lander that carried a 27kg rover with instruments to analyze the lunar soil, crashed when it deviated from its intended trajectory due to a software glitch. According to ISRO scientists, the mission is not a complete failure because the orbiter has navigated as anticipated and the lander passed through all three phases except the last phase.

Dr Madhavan Nair, former chairman of ISRO had said. "Only a small portion of the mission had failed, and although the lander had not made a soft landing, it had lost contact very close to the surface of the moon".

<https://www.republicworld.com/technology-news/science/chandrayaan-2-discovery-isros-orbiter-confirms-earlier-finding-of-water-on-moon-surface.html>

Scientists realize noiseless photon-echo protocol

Prof. LI Chuanfeng and Prof. Zhou Zongquan from University of Science and Technology of China (USTC) of the Chinese Academy of Sciences (CAS) innovatively raised and realized noiseless photon echo (NLPE) protocol. The research of entire originality reduced the noise by 670 times compared with previous strategies and achieved solid quantum memory with high fidelity. The results were published in *Nature Communications*.



Credit: Pixabay/CC0 Public Domain

First observed by Erwin Hahn in 1950, photon echo is a fundamental physical interaction between light and matter as well as an essential tool for the manipulation of electromagnetic fields. However, the intense spontaneous noise emission generated has the same frequency as the signal, it is impossible to separate them in principle.

Previous protocols, such as atomic frequency comb and the revival of silenced echo, failed to eliminate the spontaneous noise emission as much as needed.

In this study, the researchers implemented NLPE protocol in $\text{Eu}^{3+}:\text{Y}_2\text{SiO}_5$ crystal to serve as an optical quantum memory and applied a four-level atomic system to suppress the noise.

By double rephasing the pulse in the four-level atomic system, they manipulated the spontaneous noise emission to have a different frequency from the signal. So it is much easier to separate the signal from the noise emission. Though other noises were detected in practical experiment, they were all estimated to be trivial.

The results of the experiments showed that the noise was 0.0015 photons, 670 times less than previous results. Besides, the efficiency of NLPE was more than three times larger than that of previous protocols.

Furthermore, its high efficiency, high fidelity and easy-to-achieve entitle NLPE with magnificent benefits as a noiseless quantum memory protocol.

All of these advantages bring us one closer step to long-distance quantum communication.

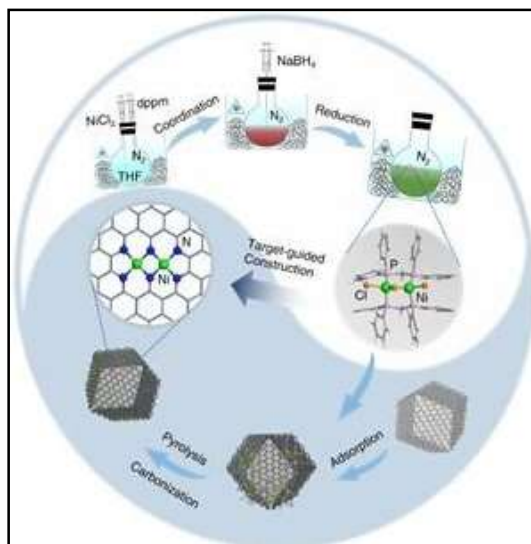
More information: You-Zhi Ma et al, Elimination of noise in optically rephased photon echoes, *Nature Communications* (2021). DOI: [10.1038/s41467-021-24679-4](https://doi.org/10.1038/s41467-021-24679-4)

Journal information: [Nature Communications](https://www.nature.com)
<https://phys.org/news/2021-08-scientists-noiseless-photon-echo-protocol.html>

Researchers design dinuclear-site catalysts and reveal the underlying mechanism

Dinuclear-site catalysts (DSCs) have drawn more and more attention from researchers due to their excellent catalytic ability through incorporating two adjacent metal atoms as the catalytic center, which helps the usage of the potential synergistic interaction.

However, it's challenging to precisely synthesis diatomic sites, so as to obtain catalysts with accurate dinuclear structure. Prof. Yao Tao with his group, from the University of Science and Technology of China (USTC) of the Chinese Academy of Sciences (CAS), proposed a method to synthesis uniform atomically precise Ni₂ sites, collaborating with Prof. Zhu Manzhou from Anhui University and Prof. Li Yafei from Nanjing Normal University. The calculated results also identified the structural evolution of dinuclear active site during electrocatalytic CO₂ reduction conditions for the first time. This work was published on the *Journal of the American Chemistry Society*.



Synthesis scheme. Credit: DING Tao et al.

To obtain the dynamic structures of catalytically active diatomic sites, scientists chose Ni₂(dppm)₂Cl₃ (dppm referring to bis(diphenylphosphino)methane, Ph₂PCH₂PPh₂), a ligand-protected diatomic cluster, as the metal precursor to introduce the metal atoms. Then the precursor was heated together with nitrogen-doped carbon to obtain supported dinuclear Ni₂ site (Ni₂/NC). This novel catalyst exhibited superior catalyzing performance as well as stability.

In order to figure out the real mechanism, researchers applied *operando* X-ray absorption fine structure (XAFS) technique to measure the charge transition of specific atoms and to make conclusions on atomic level. They unambiguously confirmed the atomic and electronic structural changes of dinuclear sites and discovered the dynamic bridge-oxygen adsorption to form active intermediate O-Ni₂-N₆.

Moreover, researchers also conducted the density function theory (DFT) calculations to provide theoretical explanations. Results suggested that the observed O-Ni₂-N₆ structure acted as the dominating reaction intermediate to form CO, leading to satisfactory selectivity and yield.

This work is instructive to design new dinuclear-site catalysts, and provide novel insights for understanding catalyzing effect. These results are also promising for solving energy problem in the future.

More information: Tao Ding et al, Atomically Precise Dinuclear Site Active toward Electrocatalytic CO₂ Reduction, *Journal of the American Chemical Society* (2021). DOI: [10.1021/jacs.1c05754](https://doi.org/10.1021/jacs.1c05754)

Journal information: [Journal of the American Chemical Society](https://phys.org/news/2021-08-dinuclear-site-catalysts-reveal-underlying-mechanism.html)
<https://phys.org/news/2021-08-dinuclear-site-catalysts-reveal-underlying-mechanism.html>

New salts raise the bar for lithium ion battery technology

By Silvia Dropulich

Lithium ion batteries are set to take a dominant role in electric vehicles and other applications in the near future—but the battery materials, currently in use, fall short in terms of safety and performance and are holding back the next generation of high-performance batteries.

In particular, the development of the electrolyte poses a key challenge for higher power batteries suitable for energy storage and vehicle applications.

At the Monash University School of Chemistry, scientists under the leadership of Professor Doug MacFarlane and Dr. Mega Kar working with local company Calix Ltd have come up with alternative solutions to this challenge with new chemistry.



Scientists hope to turn these new anions into thermally stable, non-flammable liquid salts, making them beneficial for batteries operating at high temperatures.

"The lithium salt currently being used in lithium ion batteries is lithium hexafluorophosphate, which poses a fire and safety hazard as well as toxicity," said Professor MacFarlane.

"In smaller portable devices, this risk can be partially mitigated. However, in a large battery pack, such as electric vehicle and outdoor grid scale energy storage systems, the potential hazard is much intensified. Higher voltage and power batteries are also on the drawing board but cannot use the hexafluorophosphate salt. "

In research published in *Advanced Energy Materials*, the chemists describe a novel lithium salt which might overcome the challenges of electrolyte design and replace the hexafluorophosphate salt.

"Our aim has been to develop safe fluoroborate salts, which are not affected even if we expose them to air," said lead study author Dr. Binayak Roy, also from Monash University School of Chemistry.

"The main challenge with the new fluoroborate salt was to synthesize it with battery grade purity which we have been able to do by a recrystallisation process," he said.

"When put in a lithium battery with lithium manganese oxide cathodes, the cell cycled for more than 1000 cycles, even after atmospheric exposure, an unimaginable feat compared to the hyper-sensitive hexafluorophosphate salt."

According to Dr. Roy, when combined with a novel cathode material in a high voltage lithium battery, this electrolyte far outperformed the conventional salt. Moreover, the salt was found to be very stable on aluminum current collectors at higher voltages, as required for next generation batteries.

The research is a result of a collaborative effort within the Australian Research Council (ARC) Training Centre for Future Energy Storage Technologies (www.storenergy.com.au).

StorEnergy is a federally funded Industry Transformation Training Centre which aims to train and skill the next generation of workers within the Australia energy industry and promote industry-university collaboration.

StorEnergy Director Professor Maria Forsyth from Deakin University, said: "This is a wonderful example of how industry—university collaborations supported through government research funding can support Australia's leadership in next generation safe battery technologies."

The research was conducted in collaboration with Calix Ltd., a Victoria/NSW-based company that is producing high-quality manganese-based battery materials from Australian sourced minerals. The research will assist Calix to achieve its goal of large-scale fabrication of Australian-based Li-ion batteries, aiming for grid scale energy storage systems for roll out in Australia.

Dr. Matt Boot-Handford, General Manager for R&D at Calix said: "Calix is developing a platform technology to produce high-performance, cost-competitive battery materials in Australia. We are working closely with our research partners at Monash and Deakin through StorEnergy to support the development of electrolyte systems that are compatible with Calix's electrode materials. The superior electrochemical performance and stability demonstrated by the Monash team's new electrolyte system paired with Calix's lithium manganese oxide electrode material is an exciting and important milestone that brings us one step closer to making batteries featuring Calix next-generation electrode materials a commercial reality.

"In the near future we hope to turn these new anions into thermally stable, non-flammable liquid salts, making them beneficial for batteries operating at high temperatures," said Dr. Kar.

"With the current climate conditions, designing such battery technologies with safety and stability will be important in implementing a sustainable grid-scale energy solution in Australia."

More information: Binayak Roy et al, Lithium Borate Ester Salts for Electrolyte Application in Next-Generation High Voltage Lithium Batteries, *Advanced Energy Materials* (2021). DOI: [10.1002/aenm.202101422](https://doi.org/10.1002/aenm.202101422)

Journal information: [Advanced Energy Materials](https://phys.org/news/2021-08-salts-bar-lithium-ion-battery.html)
<https://phys.org/news/2021-08-salts-bar-lithium-ion-battery.html>

New research: NIH Scientists develop faster Covid-19 test than RT-PCR

The method is the result of a collaboration among researchers at the US National Eye Institute (NEI), the NIH Clinical Center (CC), and the National Institute of Dental and Craniofacial Research (NIDCR)

New Delhi: Scientists at the US National Institutes of Health (NIH) have developed a new sample preparation method to detect SARS-CoV-2. The method bypasses extraction of the virus' genetic RNA material, potentially reducing test time and cost.

The method is the result of a collaboration among researchers at the US National Eye Institute (NEI), the NIH Clinical Center (CC), and the National Institute of Dental and Craniofacial Research (NIDCR).

Standard tests involve amplifying viral RNA to detectable levels using a technique called RT-qPCR. But first, the RNA must be extracted from the sample. Manufacturers of RNA extraction kits have had difficulty keeping up with demand during the pandemic.

The researchers used an agent made by the lab supply company Bio-Rad called 'Chelex 100 resin' to preserve SARS-CoV-2 RNA in samples for detection by RT-qPCR.

"We used nasopharyngeal and saliva samples with various virion concentrations to evaluate whether they could be used for direct RNA detection. The answer was yes, with markedly high sensitivity. Also, this preparation inactivated the virus, making it safer for lab personnel to handle positive samples," the NIH quoted lead author Bin Guan, of the US National Eye Institute, as saying. The paper has been published in iScience.

The team made their discovery by testing a variety of chemicals using synthetic and human samples to identify those that could preserve the RNA in samples with minimal degradation while allowing direct detection of the virus by RT-qPCR.

To validate the test, they collected patient samples and stored them in either viral transport media, or the newly developed chelating-resin-buffer at the NIH Symptomatic Testing Facility.

The samples in viral transport media were tested by the Covid-19 testing team at NIH's Clinical Center, using conventional RNA extraction and RT-qPCR testing. The samples in the chelating-resin-buffer were heated and the viral RNA was, then, tested by RT-qPCR. The new preparation significantly increased the RNA yield available for testing, compared to the standard method.

<https://indianexpress.com/article/explained/nih-scientists-develop-faster-covid-19-test-than-rt-pcr-7457049/>



The researchers used an agent made by the lab supply company Bio-Rad called 'Chelex 100 resin' to preserve SARS-CoV-2 RNA in samples for detection by RT-qPCR. (File photo)

