

Printed from

THE TIMES OF INDIA

IISER develops sponge-like material to capture iodine for lithium batteries

TNN | Oct 10, 2023, 01.53 PM IST



PUNE: A team from the Indian Institute of Science Education and Research (IISER) Pune has developed a material to capture hazardous iodine waste which can be used in lithium-ion batteries.

Its use will rise when nuclear energy is expected to substitute fossil fuels. With nuclear energy, there is the risk of releasing radioactive iodine during its processing.

“This novel, cost-effective, and scalable method to synthesize a sponge-like material that can selectively and rapidly sequester iodine will be of high use then,” Satyam Saurabh, a former BS-MS student who wrote the paper, said. His research with professors Sujit Ghosh and Satishchandra Ogale was recently published in ACS Materials Letters.

The team developed a sponge-like covalent-organic framework (COF) made of complex bonds of carbon, hydrogen, and oxygen that helps capture and store iodine in stable conditions from vapour or aqueous mediums.

“There are many methods to capture iodine but we also need one that uses this captured iodine, without which its storage is a problem. We developed a low-cost material that can remove 99% iodine from water. We tested it in water from Pashan Lake, Mula-Mutha river, and the Arabian Sea. It was able to capture and store it with stability,” Saurabh said.

His team used the COF material in a lithium-ion battery. Every battery requires an anode and a cathode to function, and lithium acts as the anode in the battery.

“We found that the iodine-captured material acted as an excellent cathode material in the battery, opening up the possibility of using iodine waste in battery applications. It mitigates the negative impact on the environment by removing hazardous iodine and can be used in clean energy applications,” he added.