

Scientists from India, China, U.K. develop catalyst to produce cheaper biodiesel



Dr. Samuel Lalthazuala Rokhum, centre, one of the authors of the study, with his researchers. - Photo: Special Arrangement

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A team of scientists from Assam and Odisha in India, China, and the U.K. has developed a water-repellent catalyst that can cut the cost of producing “environmentally benign” biodiesel substantially from the current levels.

The process of arriving at the “spherical superhydrophobic activated carbon catalyst” to withstand water byproduct during the production of biodiesel — pursued as a substitute for diesel, an exhaustible fossil fuel — has been published in the latest issue of the peer-reviewed *Advanced Functional Materials*, a high-impact journal of the international materials science community.

The authors of the study are Arpita Das, Kangkana Saikia, and Samuel Lalthazuala Rokhum of the Department of Chemistry, National Institute of Technology (NIT), Silchar; Chandrakanta Guchhait and Bimalendu Adhikari of NIT, Rourkela, Odisha; Da

Shi of the University of Cambridge in the United Kingdom; and Hu Li of the Guizhou University in China.

Superhydrophobic catalysts, imitating the anti-wetting or water-repulsing properties of natural surfaces such as lotus leaves, are deemed crucial for their ability to prevent the poisoning of active sites by water, produced *in situ* or as a by-product.

“Our novel superhydrophobic catalyst can be a game-changer in the field of biodiesel production. It stands out because of unmatched robustness; it can withstand the water by-product during biodiesel production,” Dr. Rokhum told *The Hindu*.

“This means the catalyst remains highly effective and can be reused multiple times, making the catalytic process more efficient and cost-effective,” he said.

He further said the catalyst, derived from biomass (cellulose), is ecologically benign, abundant, and highly affordable. “This breakthrough has the potential to significantly reduce the cost of biodiesel production, making sustainable energy more accessible,” he added.

At present, the cost of biodiesel in India is about 100 or \$1.2 per litre. Using the superhydrophobic activated carbon catalyst can bring down the cost to about 37 cents per litre. A litre of less fuel-efficient diesel costs at least 87 in India. “Biodiesel is a key player in the quest for sustainable energy. Our innovative catalyst could pave the way for broader adoption and a greener future because it makes the production process more efficient, cost-effective, and environment friendly,” Dr. Rokhum, among the world’s top five scientists in the field of biodiesel, said.