

Technology

Tamarind shell processed into nanosheets for supercapacitors

□ nicolaskross • 2 hours ago



The carbon-rich tamarind shell has been converted to carbon nanosheets for use in supercapacitors. This is an advance that can reduce the amount of agricultural waste sent to landfills.

Dr. Cuong Dang of NTU's Department of Electrical and Electronic Engineering, who led the research, exhibited fragments of tamarind shells (Image: NTU Singapore).

Bulky tamarind shells are discarded during food production and occupy considerable space in landfills. Today, a team of international scientists led by Nanyang Technological University (NTU Singapore) in Singapore has found a way to convert waste into carbon nanosheets, a key component of supercapacitors.

More from the material

A team of researchers from the University of Applied Sciences in West Norway and the University of Aragappa in India believes that scaling up

these nanosheets will be an environmentally friendly alternative to industrially produced nanosheets while reducing waste. I will. The results of the team survey are published in *Chemosphere*.

In a statement, Dr. Cuong Dang, research leader at NTU's Department of Electrical and Electronic Engineering, said: "Through a series of analyzes, we found that the performance of tamarind shell-derived nanosheets is comparable to that of industrially produced nanosheets. Porous structure and electrochemical properties. The process of producing nanosheets is activated carbon nanosheets. It is also the standard way to manufacture tamarind. "

Professor G. Ravi, Dean of the Department of Physics at the University of Aragappa, added: "Tamarind shells can reduce the amount of space required for landfill, especially in regions of Asia such as India, one of the world's largest producers of tamarind, which is tackling waste disposal issues. . "

According to NTU Singapore, to produce carbon nanosheets, researchers first washed the husks of Tamarind fruit, dried it at 100 ° C for about 6 hours, and then crushed it into powder.

Scientists then baked the powder in an oxygen-free oven at 700-900 ° C for 150 minutes to convert it into nanosheets.

According to NTU Singapore, industrial hemp fibers are commonly used in the production of carbon nanosheets, but they are heated at 180 ° C or higher for 24 hours before being exposed to further heat to convert them to carbon nanosheets. is needed.

Professor Dhayalan Velauthapillai, Head of the Advanced Nanomaterials Research Group for Clean Energy and Health Applications at the University of Applied Sciences in West Norway, said:

"The secret behind their energy storage capacity lies in their porous structure, which leads to a large surface area that helps the material store large amounts of charge."

Nanosheets derived from tamarind shells are said to have excellent thermal stability and electrical conductivity, making them a promising option for energy storage.

Researchers want to explore large-scale production of carbon nanosheets with agricultural partners. They are also working to reduce the energy required for the manufacturing process, aiming to improve the electrochemical properties of nanosheets.

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