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Translated from Italian

Here's the "artificial leaf" that turns the sun into hydrogen



Produce hydrogen from seawater using sunlight and, in the same process, eliminate hydrazine, a highly toxic industrial contaminant.

This is the dual function of the "artificial leaf" developed by researchers at the Nanyang Technological University in Singapore and described in the scientific journal "Nature Communications".

Hydrazine is essential to the device's operation. In traditional electrolysis, the reaction that produces oxygen requires a lot of energy. The researchers replaced this with hydrazine oxidation, which requires a much lower voltage and limits the unwanted formation of chlorine compounds in seawater.

A perovskite photocathode captures the light. On the other electrode, a catalyst based on iron, cobalt, and chromium promotes the degradation of the contaminant. The system operated without an external electrical voltage and maintained similar performance even with real seawater.

In tests, the device remained operational for over 72 hours. In a larger-scale experiment, the hydrazine concentration dropped to 0.5 parts per billion after about 30 hours. The prototype also produced gas during an outdoor test under cloudy Singapore skies.

“This dual-function device represents a major step forward for environmental technologies,” commented researcher Lydia H. Wong.

Industrial applications, however, remain a long way off. The prototype measures just a few square centimeters, requires highly alkaline conditions, and uses platinum and a lead-containing perovskite.

The next goal is to adapt the principle to other contaminants, to produce hydrogen during water purification.

<https://www.bluewin.ch/it/lifestyle/salute/la-foglia-artificiale-che-trasforma-il-sole-in-idrogeno-li.3630009>