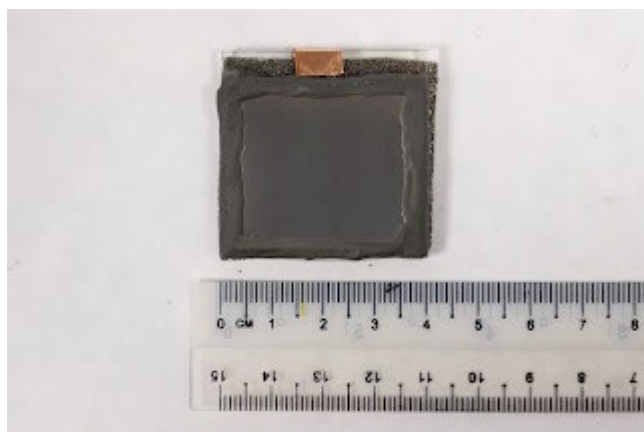


6 October 2026

Translated from Dutch

Artificial leaf produces hydrogen from seawater and simultaneously purifies wastewater



Researchers at Nanyang Technological University (NTU) in Singapore have developed an artificial leaf that can produce hydrogen from seawater using sunlight. At the same time, the device breaks down a toxic industrial substance in wastewater. The system requires no external power source for this.

In traditional electrolysis, water is split into hydrogen and oxygen using electricity. However, using seawater creates an additional problem: the salt can cause unwanted chemical reactions, resulting in the formation of toxic chlorine compounds, among others. Furthermore, oxygen production requires a relatively high amount of energy.

The researchers therefore opted for a different reaction. Instead of producing oxygen at one electrode, hydrazine is broken down there. This industrial substance can be converted into nitrogen and hydrogen relatively easily. As a result, less energy is required, and the formation of chlorine compounds is largely prevented.

The necessary electricity is generated using a thin layer of perovskite, a crystal material that is also being investigated for use in solar cells. The artificial leaf managed to function stably for three days under light comparable to full sunlight.

In a laboratory experiment, the amount of hydrazine in the wastewater was drastically reduced in about thirty hours: from approximately 1.6 percent of the weight of the water to 0.5 parts per billion. Hydrazine is used in industry, chemical production, and as fuel for spacecraft propulsion, among other applications. The substance is considered probably carcinogenic by the World Health Organization's cancer research agency.

For the time being, the technology is not yet suitable for large-scale application. The perovskite used contains lead and can therefore degrade rapidly in contact with seawater. The researchers are currently protecting the material with titanium foil and a conductive resin. In addition, real industrial wastewater is much more complex in composition than the water used in the laboratory tests. Therefore, further developments are needed for practical application.

<https://waternieuws.blogspot.com/2026/09/kunstmatig-blad-maakt-waterstof-uit.html>