

Standalone system to produce drinking water via solar energy

February 12 2018



Credit: Asociación RUVID

Researchers from the University of Alicante's research group in applied electrochemistry and electrocatalysis have developed a standalone system for desalinating and treating water through electrodialysis. The system is directly powered by solar energy and can be applied in off-grid areas.

Designed only for desalinating water, it is a sustainable, eco-friendly technology powered by [solar photovoltaic panels](#) in a CO₂-free process, thus not contributing to climate change.

Group director Vicente Montiel says, "The new system requires no batteries and has none of the economic and environmental costs involved

in managing empty batteries. Furthermore, it can be adapted and applied for treating water of many different origins, including seawater, wells containing brackish water, treatment plants and industrial processes, which makes it particularly well-suited to remote, off-grid areas." The equipment can be employed to obtain [clean water](#) for [human consumption](#), irrigation, street cleaning and other uses, when there is no energy grid available or following natural disasters such as earthquakes, floods or fires.

Montiel also points out that the technology could be a potential solution to drought, just like osmosis plants.

The research group has a pilot and demonstration plant able to generate a cubic metre of [drinking water](#) every day. They are looking for companies interested in the commercial exploitation of the technology through licence and/or technical cooperation agreements.

"This is not a new technique, as in the Canaries electrodialysis has been employed for many years for desalination purposes," Montiel says.

"What is new about this UA-developed technology is that all electricity supplied to this system comes from a photovoltaic solar field."

More specifically, this technique "can only be employed to treat water with a salt content exceeding that tolerated for human consumption or irrigation. If the water has other problems, for instance the presence of organic matter, this technology cannot be applied."

A byproduct of all desalination processes is a certain amount of water, which, despite the treatment, is unfit for human consumption or irrigation, as its salt concentration is much higher than it was before treatment. Such water is commonly known as "reject water." However, the director of the group says, "With the UA-designed system, it is possible, for instance, to regulate reject water salinity so that it is similar

to seawater salinity."

Among other advantages, this new [technology](#) makes it possible to recover approximately 80 or 90 percent of all treated water.

Additionally, it makes the most of the maximum energy supplied by panels when exposed to sunlight, and its availability is also high, as it enables treated [water](#) accumulation for periods in which renewable sources do not provide enough energy.

Provided by Asociacion RUVID

Citation: Standalone system to produce drinking water via solar energy (2018, February 12) retrieved 8 April 2024 from <https://phys.org/news/2018-02-standalone-solar-energy.html>

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