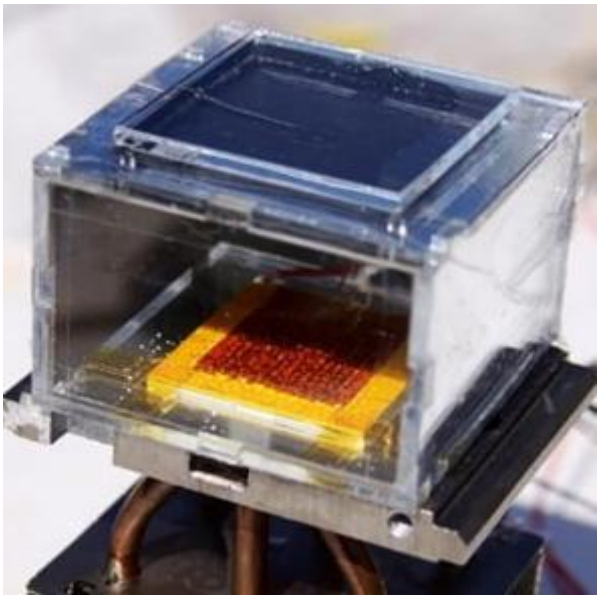
Water harvester can pull moisture out of the air using only power of Sun



Droughts could be consigned to history after scientists invented a water harvester which can pull moisture out of the air using only the power of the Sun.

The prototype, designed by scientists at MIT and the University of California, works even in desert conditions and could eventually provide households with all the drinkable water they need, simply by extracting dampness from the surrounding atmosphere.

The solar-powered harvester can provide 2.8 litres of water from the air over a 12 hour period in conditions as dry as the Mojave Desert, where the average humidity is around 20 per cent.

Researchers say it could provide the first ‘personalised water’, taken directly from vapour in the local environment.

"This is a major breakthrough in the long-standing challenge of harvesting water from the air at low humidity," said Professor Omar Yaghi, at UC Berkeley.

"There is no other way to do that right now, except by using extra energy. Your electric dehumidifier at home 'produces' very expensive water.

"One vision for the future is to have water off-grid, where you have a device at home running on ambient solar for delivering water that satisfies the needs of a household. I call it personalised water."

The device is an open air chamber containing a lattice-like structure made from zirconium metal and adipic acid sandwiched between a solar absorption panel and a condenser plate.

The zirconium and acid structure traps the water vapour then sunlight drives the water towards the cooler condensing plate which returns the vapour to liquid water so it can drip into a collector.

Two-thirds of the world's population experiences annual water shortages and yet an abundance of water – an estimated 13,000 trillion liters worldwide – is present in the air around us.

"This work offers a new way to harvest water from air that does not require high relative humidity conditions and is much more energy efficient than other existing technologies," said Evelyn Wang, a mechanical engineer at MIT.

The team is planning to improve the harvester so it can suck in much more air, and produce more water. But even the prototype is powerful enough to keep someone alive in desert conditions.

"We wanted to demonstrate that if you are cut off somewhere in the desert, you could survive because of this device," said Professor Omar Yaghi.

"A person needs about a Coke can of water per day. That is something one could collect in less than an hour with this system."

The research was published in the journal Science.