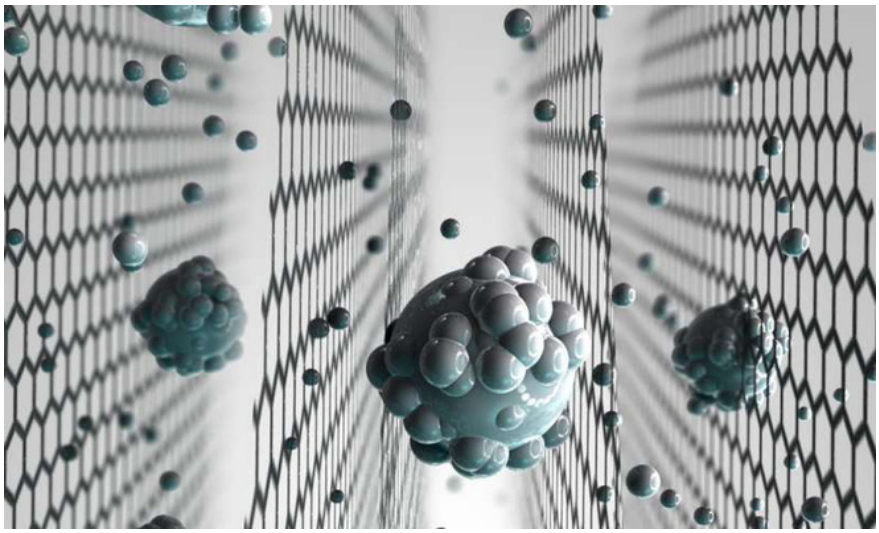
Successful fabrication of filters removes salt from seawater to convert into drinking water

The membrane of graphene oxide produced by scientists at the University of Manchester, England, has the ability to remove salt from seawater to convert into highly efficient drinking water.

The membrane of graphene oxide produced by scientists at the University of Manchester, England, has the ability to remove salt from seawater to convert into highly efficient drinking water.

1. The device removes 99,999% of bacteria in dirty water in just 20 minutes
2. Discover the process of turning wastewater into beer in the United States

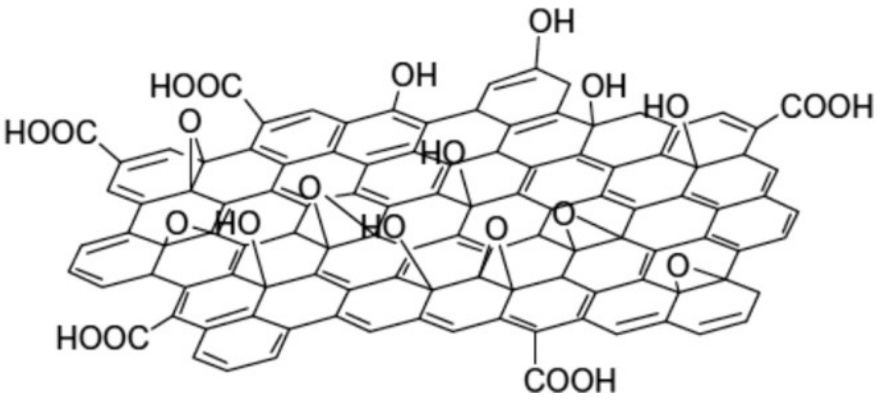
Professor Rahul Nair, who led the team of scientists working on the project, said Graphene oxide was produced by simple oxidation in the laboratory. They coated graphene oxide on a substrate or porous material and used it as a membrane. Compared to conventional graphene, graphene oxide has many potential applications as well as cheaper material costs.



Membrane filter graphene oxide has the ability to remove salt from seawater.(Photo: Manchester University.)

With regular graphene filters, the manufacturer does a very difficult job of drilling small holes in the membrane at a size of less than a nanometer so that the salt molecule cannot move through because the carbon atoms are arranged in Hexagonal network. With this method it is difficult to produce large quantities of single-layer graphene and the production of graphene is also quite expensive.

The graphene oxide membrane has been shown to be good at filtering nanometer sized particles, organic molecules and large size salts. But when submerged in water, the graphene oxide membrane bulges out, causing small salt molecules to flow through the hole in the membrane together with water, so it cannot be filtered out.



Structure of graphene-oxide.

To overcome this problem, Nair and co. Prevented the expansion of graphene oxide films by placing baffles made of epoxy resin on either side of the membrane. As a result, they can adjust the properties of the filter, allowing less salt or preventing small sized salts to pass.

According to the United Nations estimates, by 2025, 14% of the world's population faces water scarcity due to climate change.

Currently, desalination technology with polymer filters is being used by many countries around the world, but this filtering process is expensive and ineffective. High efficiency filter for graphene oxide will be a quicker, more compact, cheaper alternative that will help us solve the scarcity of clean water.

Next, researchers will compare these graphene oxide sheets with current materials on the market.

The study was published in Nature Nanotechnology.