

A catalyst has been found to convert nitrates into water and air

Engineers at the Nano Technology Center have developed Rice University's Nano Processing System to find a catalyst to clean up toxic nitrate in drinking water by turning them into air and water.

Engineers at the Nano Technology Center have developed Rice University's Nano Processing System to find a catalyst to clean up toxic nitrate in drinking water by turning them into air and water.

The study was published in ACS Catalyst magazine of the American Chemical Society.

Rice's chemical engineer, Michael Wong, a leading research scientist, said: *"Nitrate comes mainly from agricultural wastewater flows, affecting agricultural communities around the world . "* Nitrate is a substance related to environmental problems and a health problem because they are toxic.

There are ion exchange filters that can remove them from the water, but need to be cleaned for several months to reuse them and when that water boils can facilitate the return of a little nitrate in the water.



Wong's laboratory has previously developed catalysts based on nanoparticles, tiny pieces of metal under a microscope that speed up chemical reactions. In 2013, his team showed that small golden spheres alternating stains of palladium could break nitrogen, the more toxic liquid of nitrate.

"Nitrate is a molecule that has one nitrogen atom and three oxygen atoms , " Wong explained. Nitrates turn into nitrite if they lose oxygen, but nitrite is even more toxic than nitrates.

" In the end, the best way to remove nitrates is a catalytic process that decomposes them into nitrogen and oxygen. There are more than 75% of the earth's atmosphere being nitrogen in the air, so we're moving," he said. Nitrates into air and water " .

Toxic nitrate for babies and pregnant women and can also cause cancer. Nitrate pollution is common in agricultural communities, especially in the United States and California Valley where fertilizer is used a lot, and some studies have shown that nitrate pollution is increasing due to model changes. using land.

From their previous work, Wong's team knew that gold-palladium nanoparticles were not a good catalyst to break down nitrates. Co-author Kim Heck, a researcher at Wong's lab, said the search for published scientific documents showed another possible use: indium and palladium.

Heck said: *"We were able to optimize that, and we found that about 40% of the surface of the sphere of palladium combined indium molecules gave us the most active catalyst ' .*

Working with chemical engineers Jeffrey Miller of Purdue University and Lars Grabow of the University of Houston, Rice team discovered that indium accelerates the breakdown of nitrates while palladium then causes indium to oxidize. forever.

Wong said his team will work with industry partners and other researchers to turn the process into a useful water treatment system.

See more:

1. What do you know about platinum - Platinum, one of the most rare metals on the planet?
2. This is a new nanomaterial that can reduce vehicle emissions pollution

You finished reading the article "**A catalyst has been found to convert nitrates into water and air**" edited by the [TipsMake](#) team. We hope this article has provided you with many useful tech tips and tricks. You can search for similar articles on tips and guides. Thank you for reading and for following us regularly.