



## TECHNOLOGY

# Ammonia Encapsulated in Hydrogels for Carbon Sequestration

## OVERVIEW

While great strides have been made towards the development of new technologies that will eventually alleviate our dependence on carbon-based energy, our environment is currently suffering the ill effects of increased carbon dioxide (CO<sub>2</sub>) in our atmosphere. Carbon sequestration, the process of removing carbon from the atmosphere through biological, chemical or physical processes, is the solution to this crisis. Currently, carbon sequestration technology is expensive due to the high cost of materials and the short effective life of these materials.

Researchers at the University of Maryland have designed a biodegradable hydrogel that encapsulates aqueous ammonia, which, when dispersed over large agricultural land plots, reacts with the CO<sub>2</sub> in the atmosphere and is then converted into ammonium bicarbonate, a common fertilizer. Unlike current CO<sub>2</sub> capture plants utilizing monoethanolamine (MEA), the aqueous ammonia process has no degradation or equipment corrosion problems. Additionally, the comparable cost of the ammonia is about one sixth of MEA while the loading of the CO<sub>2</sub> is 3 times that of MEA.

### Applications:

- Large scale environmental CO<sub>2</sub> removal

### Advantages:

- Converts a problem of excess environmental CO<sub>2</sub> to an advantage of agricultural fertilizer
- One sixth the cost of current CO<sub>2</sub> removal chemicals
- 3 times the CO<sub>2</sub> loading of current chemicals

## CONTACT INFO

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## Additional Information

### INSTITUTION

University of Maryland, College Park

### PATENT STATUS

Patent(s) pending

### LICENSE STATUS

Contact OTC for licensing information

## **CATEGORIES**

- Chemical

## **EXTERNAL RESOURCES**

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