



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 (CO₂) 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 CO₂ in the atmosphere and is then converted into ammonium bicarbonate, a common fertilizer. Unlike current CO₂ 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 CO₂ is 3 times that of MEA.

Applications:

- Large scale environmental CO₂ removal

Advantages:

- Converts a problem of excess environmental CO₂ to an advantage of agricultural fertilizer
- One sixth the cost of current CO₂ removal chemicals
- 3 times the CO₂ loading of current chemicals

CONTACT INFO

UM Ventures
0134 Lee Building
7809 Regents Drive
College Park, MD 20742
Email: umdtechtransfer@umd.edu
Phone: (301) 405-3947 | Fax: (301) 314-9502

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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