

Sugar battles oil spills

August 12 2010



Image: wikipedia

The environment has often suffered from the catastrophic effects of an oil spill, the most recent example being the oil spill in the Gulf of Mexico. The search for ways to remove oil from polluted water is therefore urgent. US scientists working with George John have now developed a novel gelator that solidifies the oil into a gel from which it can easily be later reclaimed.

As the scientists from the City College of New York and the University of Maryland report in the journal *Angewandte Chemie*, their gel is based on compounds synthesized from natural sugars.

All previously developed substances meant to selectively remove spilled oil from water and contain it have various disadvantages. These substances include dispersants that emulsify the oil, solid powders that

adsorb the oil, and gelators that solidify the oil into a gel. In the past, polymers were primarily used, though they were difficult to mix with viscous types of oil and the retrieval of the bound oil was a very complex process.

John and his colleagues propose a new class of gelators based on naturally occurring [sugar](#) alcohols. John lists the advantages, “They are inexpensive, easy to produce, nontoxic, and biodegradable.” Gelators are constructed so that their molecules aggregate through a self-organization process into a three-dimensional network of fibers. This network sucks up the oil molecules and swells into a gel with an enormous capacity.

The researchers mixed different types of oil—ranging from [crude oil](#) to diesel, gasoline, and organic solvents—with water and added a few drops of the new gelator. This immediately formed a gel that separated from the water phase. The gel became so solid that it closed off the reaction flask like a cork. The flask could be inverted without any spillage of liquid. “In case of an oil spill, it would be relatively easy to collect the gel from the surface of the water,” says John. Simple distillation under vacuum is all that is needed to fully release oil from the gel. After separation, both the oil and the gelator are ready to be used again.

“We are optimistic that our sugar-based gelators provide an approach for the development of new materials to combat oil slicks on water, says John.

More information: *Angewandte Chemie* International Edition, [dx.doi.org/10.1002/anie.201002095](https://doi.org/10.1002/anie.201002095)

Provided by Angewandte Chemie

Citation: Sugar battles oil spills (2010, August 12) retrieved 24 April 2024 from <https://phys.org/news/2010-08-sugar-oil.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.