

Arthur Landwehr

ARD Radio Washington, DC

Topic: Research in Minnesota - plastic that dissolves on command

Shape: BmE

Customer: ARD long

Date: Thursday, September 20, 2018

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Research in Minnesota - plastic that dissolves on command

What if one of our biggest problems is solved in a university lab in Minnesota: get rid of plastic waste.

In Marc Hillmyer's lab, a small miracle happens: plastic foam sits in a bowl. It is heated slowly. After a while, it disappears. Simply disintegrating into a powder.

Once a shopping bag, a plastic cup, or a food processor have done their job, then they can burden the environment for centuries as garbage in the sea or in the countryside. We all know that, but we have to do it better, says Marc Hillmyer, Principal Investigator of the Center for Sustainable Polymers at the University of Minnesota.

“We work on polymers that are absolutely stable under normal conditions. But when heated, they disintegrate into their original components,” Hillmyer says.

In principle, it works like this: plastic starts out as single molecules, called monomers, which are mostly derived from petroleum. When exposed to heat, they hook together into chains like a zipper. They stay together for a lifetime, unless you burn them.

* Unzipping sound *

“The idea is that with a certain impulse, the polymer is forced to open the zipper and disintegrate again into small single molecules. From there, you simply bring the molecules back together to create new high-quality plastics. And that works. The chemists add certain elements to the plastics that serve as impulses or triggers,” Hillmyer says.

* Trigger sound *

“These triggers can be specific light, heat, or otherwise. They chemically transform the polymers back into their constituents,” Hillmyer says.

Light would go on plastics that would otherwise be used in the dark. If they come under certain lamps, they simply disintegrate. For others, it's a chemical that causes decay. Marc Hillmyer has patented plastics that are doubly sustainable: the individual molecules are extracted with the help of bacteria from biomaterials such as corn or beets. And the resulting plastics decomposes on command.

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* Foam sounds *

“We use our material for foams. These can be used as seat cushions for example. But you can apply them wherever you need elastic material,” Hillmyer says.

Chemically, when stable foams are produced, they last as long as other foams. A Hillmyer-based startup is already developing foam for car seats, mattresses, and sports mats. When they are old, they are heated to about 200 degrees. Then they simply turn into powder and can be immediately made into a new foam. The mattresses do not end up in any landfill and are not burned.

Theoretically, a technology in which plastic decomposes into its components on command can also be incorporated into shopping bags or straws. Only today is it so cheap that chemical recycling is not worthwhile. But that may only be a matter of time if, as planned by the EU, disposable plastic should be completely banished.

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