THE STUDENT NEWSPAPER OF NORTH CAROLINA STATE UNIVERSITY SINCE 1920

TECHNICIAN

TUESDAY
FEBRUARY
7
2012

Foamy filters prove to be cheap and effective

Researchers in the College of Natural Resources have isolated a new biomaterial for filter use.

Daniel Weikel
Correspondent

A foam material made from the byproducts of both the forest and seafood industry may just solve quite a few problems with water contamination.

Two researchers from the department of forest biomaterials in the College of Natural Resources created a new material that demonstrates potential in removing contaminants for clean drinking water. Their initial goal was to find a more constructive and useful way to utilize byproducts from the forest industry, hemicellulose, which is currently combusted for energy production.

"This work is important because it is an example of how we can take underutilized agricultural and forest derived materials and replaced petroleum based materials," Richard Venditti said.

This foamy material is a combination of hemicellulose and citric acid, which is then reacted with chitosan, a biological material obtained from crushed crustacean shells. Originally, Joel Pawlak and Venditti intended the material to be used to replace other super absorbent materials in items such as diapers, which currently use a material derived from petroleum.

One of the goals of the department of forest biomaterials is to derive renewable and sustainable products from the forest.

"This type of product is very well matched to North Carolina as we have the seafood industry from the coast, as well as the forest industry," Pawlak said.

While testing the material, the investigators found interesting properties as they soaked this biological foam in different salt solutions. After removing the foam from these solutions, the researchers saw the material had increased in weight, which shocked them initially. After various reconsiderations, Pawlak and Venditti realized the foam was removing the salt from the solution. After more testing, it was theorized that the foam has a unique property where it a small differences in polarity which attracts the ions from the solution.

Soon they tried to use the foam to filter various solutions, including many salt compounds, and other toxic chemicals and minerals, such as arsenic. Researchers have identified the filter's potential in developing countries to decontaminate drinking water cheaply. Not to mention the material can be utilized in a variety of ways, as a filter, possibly like a teabag and also ground up into particles.

A strong point for this new technology is its independence from electricity, which adds even more value its versatility. This technology can also be deployed in cases of natural disasters, which leave many with out clean drinking water.

As of now a team from the Poole College of Management's TEC (Technology, Education, and Commercialization) program, has been working on commercializing the product as it shows great promise. Currently, their focus is in the uses for water filtering, while the product may be useful in the diaper industry as initially planned there is much more potential. The TEC program has been working with the researchers to refine how it can be marketed and used.

Also, there is a focus on whether or not the foam can be reused, which would reduce costs and provide a more environmental and financially sustainable solution to particle filtration. If not, they are working on a way to regenerate the material for more use, according to Venditti.

According to researchers, this product is a success story because of its upcoming progression from the lab to the world. This material, as shown, cannot only be used in an industrial setting but also to help people.

"This kind of project can serve as a model for other researchers to look at the ability of other natural polymers and how they can be modified into useful products," Venditti said.