Scientists develop material to remove radioactive contaminants from drinking water

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A combination of forest byproducts and crustacean shells may be the key to removing radioactive materials from drinking water, researchers from North Carolina State University have found.

"As we're currently seeing in Japan, one of the major health risks posed by nuclear accidents is radioactive iodide that dissolves into drinking water. Because it is chemically identical to non-radioactive iodide, the human body cannot distinguish it – which is what allows it to accumulate in the thyroid and eventually lead to cancer," says Dr. Joel Pawlak, associate professor of forest biomaterials. "The material that we've developed binds iodide in water and traps it, which can then be properly disposed of without risk to humans or the environment."

The new material - a combination of hemicellulose, a byproduct of forest materials, and chitosan, crustacean shells that have been crushed into a powder - not only absorbs water, but can actually extract contaminates, such as radioactive iodide, from the water itself. This material, which forms a solid foam, has applications beyond radioactive materials. Pawlak and fellow researchers found that it has the ability to remove heavy metals – such as arsenic – from water or salt from sea water to make clean drinking water.

"In disaster situations with limited-to-no power source, desalinating drinking water is difficult, if not impossible. This foam could be brought

along in such situations to clean the water without the need for electricity," Pawlak says. "This material could completely change the way we safeguard the world's drinking water supply."

The foam, which is coated on wood fibers, is used like a sponge that is immersed in water. For smaller-scale applications, the foam could be used in something like a tea bag. Or on a larger scale, water could be poured through it like a filter.

Provided by North Carolina State University