March 4, 2013

New Version of Fibertect More Viable at Cleaning Nerve Chemical Surrogate

Part of the added benefit of this new decontamination wipe is that it contains biodegradable cotton.

Written by John Davis

The powdery M291 decontaminant leaves a dirty residue after cleaning.

A new version of Fibertect®, a nonwoven decontamination wipe created by researchers at Texas Tech University, has proven itself more viable at cleaning up a nerve chemical surrogate than the decontamination substance currently used by the U.S. Department of Defense (DoD), which is currently being phased out.

Seshadri Ramkumar, lead investigator on the project and inventor of Fibertect®, said that when compared to the powdered decontaminant called M-291, the all-cotton version of nonwoven wipe paired with an activated carbon center cleaned up not only the chemical surrogate to the nerve gas soman, but also adsorbed its vapors five times better.

The results were published in the peer-reviewed *Journal of Engineered Fibers & Fabrics*, by INDA – Association of the Nonwoven Fabrics Industry. Experiments in the research were conducted by Utkarsh Sata, a co-investigator on the project.

"The basic structure is still Fibertect®," Ramkumar said. "This is an improved reiteration of Fibertect®. This is just two nonwoven cotton layers with the carbon in between. The cotton composite takes liquid up very quickly and can adsorb vapors more efficiently than the powdered decontaminant."

Seshadri Ramkumar

Part of the added benefit of this new Fibertect® is that it contains biodegradable cotton, Ramkumar said. A problem with the powdery form is that it leaves dirty residue.

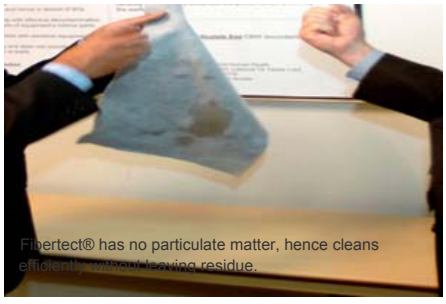
"That is why the U.S. Department of Defense wants to get away from the powdery form," he said. "Fibertect® is a fabric. It is skin-friendly. When it comes to adsorbing the surrogate nerve agent's vapors, it just works better. So the powdered decontaminant will be phased out."

In 2005, Ramkumar and his team at the Institute of Environmental and Human Health (TIEHH) at Texas Tech studied the absorbent capabilities of cotton to create the Fibertect® wipe that can adsorb and neutralize gases and liquids that might be used in chemical warfare.

"Fibertect contributes to our national security and helps with the safety of our first responders," Sata said.

The process to make Fibertect® has received a patent and has been validated for use as a low-cost decontamination wipe for the U.S. military and the Department of Homeland Security. Also, the wipe's qualities were re-engineered to create a better absorbent material to pick up the oil slicks inundating Gulf Coast beaches following the Deepwater Horizon disaster in 2010.

Ron Kendall, a co-investigator on the project, said the creation of Fibertect® began as a need to develop a decontamination wipe system for the human skin, which was a top priority for the Pentagon at the time.



Fibertect® has no particulate matter, hence cleans efficiently without leaving residue.

This has resulted now in the invention of Fibertect®, a patent and now commercialization.

"The powdered form is very difficult to handle and to apply toward decontamination purposes," Kendall said. "And it is so much easier to handle and apply toward decontamination needs than M-291 carbon system. We're learning more and more of absorption capabilities of cotton -carbon composite."

Other researchers included Eugene Wilusz of the U.S. Army Natick Soldier RD&E Center, Steve Mlynarek of the University of South Florida and Gopal Coimbatore of Texas Tech.

The research was funded in part by DoD, Cotton Inc., the International Cotton Research Center, Texas Department of Agriculture, The Cotton Foundation and The CH Foundation.

The Institute of Environmental and Human Health develops environmental and health sciences research and education at Texas Tech and Texas Tech University Health Sciences Center.

The institute's goal is to position Texas Tech as an internationally recognized force in the integration of environmental impact assessment of toxic chemicals with human health consequences, framed in the context of science-based risk assessment to support sound environmental policy and law.

RELATED

Leigh Daniel Cordes: Running to a Better Life

Board of Regents Elects New Officers, Swears in Newly Appointed Members

2012 Teaching Academy Inductee: Muyakh Dass