

RESEARCHERS FROM LAWRENCE LIVERMORE, TWO OTHER INSTITUTIONS WORK ON PERSONAL DECONTAMINATION SYSTEM

Researchers from Lawrence Livermore National Laboratory and two other institutions have described a major step toward creating a universal personal decontamination system for almost any toxic or hazardous chemical.

The scientists have reported on the development of a layered wipe that can be used to rapidly decontaminate people and equipment exposed to a wide range of military and industrial chemicals, including the blister agent sulfur mustard. These wipes could assist in saving the lives of soldiers and civilians.

Their research results are described in an article slated for online publication today in the American Chemical Society journal, *Industrial & Engineering Chemistry Research*, a bi-weekly publication.

Under a study conducted by LLNL's Forensic Science Center, researchers evaluated 30 different decontamination materials for removing gross chemical contamination from surfaces.

The study results showed that a nonwoven dry wipe material with an activated carbon core sandwiched between two absorbent layers turned in the top performance. It is designed by researchers at The Institute of Environmental Health and Human Health (TIEHH) at Texas Tech University.

The decontamination system currently used by the military – called Reactive Skin Decontamination Lotion (RSDL) – is effective for a small subset of industrial chemicals and chemical warfare agents.

However, according to LLNL chemical engineer William Smith, one of the study's co-authors, "By combining the existing military decontamination system with this wipe, there is promise for treating nearly every chemical. You're in much better shape using both technologies than with either one alone."

The Lab's Forensic Science Center evaluated existing and novel materials for their chemical decontamination capabilities. They looked at the ability of the combined system – the TIEHH-developed layered wipe followed by use of RSDL -- to absorb sulfur mustard, a toxic liquid that causes skin blistering, as well as four other chemicals – sulfuric acid, nitric acid, methylparathion and phosphorous trichloride.

The Forensic Science Center studies found:

- O The newly developed fabric exhibits excellent resistance to corrosive chemicals and minimizes vapor hazards after decontaminating toxic chemicals;

- O The layered wipe can absorb a large volume of most liquids, while maintaining its integrity;

- O The fabric is flexible so that it conforms to the surface being cleaned;

The next steps for advancing the decontamination system, in Smith's view, are to conduct field trials of the wipe and RSDL used in conjunction to evaluate their usability, and to test the two systems' efficacy with other chemical agents and industrial chemicals.

The project was funded by the U.S. Department of Homeland Security in 2004 and has been managed by the Technical Support Working Group, a joint venture between the U.S. State Department and the military.

Other LLNL researchers who co-authored the study include chemists Carolyn Koester and Adam Love, and former Laboratory employee Garrett Keating.

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