

Military develops multi-purpose 'green' decontaminants for terrorist attack sites

April 28 2010



Credit: AI-generated image ([disclaimer](#))

Chemists with the United States military have developed a set of ultra-strength cleaners that could be used in the aftermath of a terrorist attack. The new formulas are tough enough to get rid of nerve gas, mustard gas, radioactive isotopes, and anthrax. But they are also non-toxic, based on ingredients found in foods, cosmetics, and other consumer products. A

detailed evaluation of the cleansers appears in ACS' *Industrial Engineering and Chemistry Research*, a bi-monthly journal.

George Wagner and colleagues explained that chlorine- and lye-based decontamination agents have serious drawbacks. In addition to being potentially hazardous, they can react with chemical weapons and materials in the environment to form new toxic substances. If the military needed to decontaminate a large area, the runoff could harm people and the environment.

To solve that problem, military scientists developed the Decon Green suite of decontamination agents. The main ingredients in each Decon Green formula are peroxides, the same substances that are in many household cleaners and whitening toothpaste. To bolster their effectiveness, the peroxides are mixed with bicarbonates or other non-toxic bases. That combination produces peroxyanions, highly reactive ions that can clean just about anything. It ensures that chemical weapons, like nerve gas, will break down completely.

Wagner describes putting the new cleaning agents through an exhaustive battery of tests. His team concluded that each formula can break down [toxic chemicals](#), rather than just washing them away. They also showed that Decon Green is quite good at killing anthrax spores, and removing radioactive cesium and cobalt from smooth surfaces. One of the formulas that they tested can work in sub-zero temperatures. Another is a powder, which can be easily transported and mixed with water at the scene of an emergency. All but one of the ingredients in liquid Decon Green can be found in food, cosmetics, hygiene products, or vitamin pills.

More information: "All-Weather Hydrogen Peroxide-Based Decontamination of CBRN Contaminants", *Industrial Engineering and Chemistry Research*.

Provided by American Chemical Society

Citation: Military develops multi-purpose 'green' decontaminants for terrorist attack sites (2010, April 28) retrieved 26 April 2024 from <https://phys.org/news/2010-04-military-multi-purpose-green-decontaminants-terrorist.html>

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