Decontamination Systems for First Responders

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TDA Research, Inc. has recently developed two complementary systems for decon of hazardous chemical and biological threats. Here we describe their application by first responders, including recent efficacy test data and system modifications to improve ease of use.

One component of the system is the detergent SSDX-12®, which is both qualified for use in cleaning military aircraft per MIL-PRF-87937 and proven effective in removing a wide range of threat agents from surfaces. A second component of the system is TDA's electrochemical generation of chlorine dioxide ($eClO_2$) technology. Decontaminants used to treat surfaces that are contaminated with chemical and biological warfare agents must be stable so they can be stored for long periods of time and stockpiled for times of need, environmentally benign with no hazardous residue, safely handled by personnel and easily transported. At the same time, the decontaminant must be very reactive upon use so that they can quickly detoxify chemical warfare agents and sterilize bacterial spores. TDA's $eClO_2$ technology elegantly addresses these conflicting requirements for stability and reactivity, by storing and transporting a solid salt, which when needed is dissolved in water and activated just as it is applied to produce a reactive, fast acting, decontaminant solution.

This $eClO_2$ technology has demonstrated efficacy against live chemical warfare agents and is registered with the EPA under FIFRA as effective against bacterial spores, including anthrax (EPA Reg. No. 85797-1). Scientists at the Naval Surface Warfare Center Dahlgren Division completed efficacy testing against a 1x107 CFU *Bacillus anthracis* Ames (anthrax) spore challenge. The virulent anthrax was eliminated within one-minute contact time (Buhr et al. 2011).

These two systems are complementary, with SSDX-12® providing effective cleaning (physical removal) of contaminants with maximum materials compatibility, and the $eClO_2$ system rapidly neutralizing both CW agents and other toxins. It has recently been evaluated against fentanyls and other commonly encountered hazardous materials. We will present data describing how SSDX-12® and $eClO_2$ are useful to first responders.