Research on Low Level Hydrogen Peroxide Fumigation for Remediation of Indoor Environments

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The imminent threat of a chemical warfare agent (CWA) release in infrastructure, building or transportation hub is driving U.S. EPA's Homeland Security Research Program (HSRP) to develop research that evaluates potential decontamination technologies for chemical agents. The use of low-concentration hydrogen peroxide vapor (LCHPV) fumigation has gained attention as hydrogen peroxide is readily available, efficacious, green technology, and relatively easy to implement as a decontamination approach. The goal of this research is to determine conditions under which LCHPV fumigation can be used to decontaminate CWAs or selected pesticides from interior structures containing porous materials that are hard to clean using traditional surface decontamination approaches. This study will assess LCHPV decontamination on four material surfaces that have been contaminated with the CWAs O-ethyl S-[2-(diisopropylamino) ethyl] methylphosphonothioate (VX) and potentially $C_4H_8Cl_2S$ (Sulfur mustard, HD). The surfaces types to be tested are 1) stainless steel, 2) painted wood, 3) vinyl tile, and 4) rubber. Testing will be performed using coupons of fixed size in an environmental test chamber with controlled air flow rates, temperature and LCHPV levels. Testing and analysis will determine efficacy for various LCHPV treatment durations for each material type. This poster describes work currently under way at the Southwest Research Institute, funded by the National Homeland Security Research Center.