

PROTECTION - SCIENCE AND TECHNOLOGY ADVANCES FOR CHEMICAL AND BIOLOGICAL PROTECTION

A Decontamination Study On A Range Of Coupons Contaminated By Chemical Warfare Agents Through An Aerosol System

Jeong-Yu Son ADD **Kyoung Chan Lim** Agency for Defense Development in ROK **Kyeong Min Cho** Agency for Defense Development in ROK **Jin Young Lee** Agency for Defense Development in ROK

Introduction: The decontamination methods of chemical warfare agents (CWAs) have been developed by using a variety of methodologies such as hydrolysis, oxidation, and catalytic system. However, the traditional reaction conditions could be only conducted in the laboratory due to environmental issue. For example, traditional decontamination such as chlorine oxidation are known to be too corrosive and impact the functionality of equipment and items, thus these methods are difficult to be carried out not only for items exposed by CWAs but also for the contaminated building. Therefore, we decided to develop the efficient decontamination method that use commercially available neutralizers known to be less corrosive and environmentally acceptable for widespread use by aerosol system.

Materials and Methods: Recently, we have studied the decontamination methods using a combination of a variety of commercially available neutralizers on nerve and blister agents. [All CWA's were used in compliance with the CWC]. Among a wide range of decontaminants, the mixture of H₂O₂, peracetic acid, and catalyst was chosen as a best neutralizer for the aerosol system. A surface of coupons contaminated by agents was prepared into the safety chamber, the decontaminates were added onto the surface of coupons vis an aerosol system. After indicated time, the reaction mixture was analysed by NMR and GC/MS.

Results: We have studied a wide range of commercially available neutralizers known to be less corrosive against CWAs by aerosol system. Among them, the indicated ratio of mixtures by aerosol system was found to provide efficient decomposition yield of the CWAs comparable to use the single ratio of neutralizer. Consequently, it is expected that these fundamental data could be used in real situation where all instruments and items were contaminated through the aerosol system which is proven to be less corrosive and environmentally acceptable for widespread use.