

MITIGATION - SCIENCE AND TECHNOLOGY ADVANCES FOR CHEMICAL AND BIOLOGICAL CONTAMINATION MITIGATION

Development, Evaluation, And Optimization Of A Chemical Decontaminant For Chemical Warfare Agents

Valentine Nzengung MuniRem Environmental LLC Spencer Nzengung MuniRem Environmental, LLC

In 2010, MuniRem Environmental participated in the USDoD's evaluation of its chemical neutralant (MuniRem®), as a potential alternative for the degradation of neat mustard (HD). The bench scale evaluation was performed at the former Non-Stockpile laboratory in Edgewood, Maryland. The results of the evaluation test showed that the MuniRem reagent not only neutralized, but destroyed >90% of the neat mustard gas in six hours to ethylene, chloride, and sulfate.

After optimization of the original MuniRem reagent from 2010, the optimized MuniRem reagent demonstrates superior performance when compared to the Joint Program Executive Office's objective of reducing the concentration of the agent to 1% or below in six hours. Specifically, the optimized MuniRem neutralant achieves the desired level of destruction (>99%) of four different chemical warfare simulants in less than one hour.

The MuniRem reagent is shipped worldwide in US Department of Transportation and UN approved packaging. At the point and time of use, the dry MuniRem Reagent powder is mixed with fresh or salt water to produce a solution that simultaneously neutralizes and destroys explosives and CWAs. The spray application of the MuniRem solution to decontaminate surfaces is achieved using commercially available corrosion resistant spray equipment. To reduce water and other logistical requirements, we have developed a non-aqueous liquid form of the reagent that does not freeze at zero degrees Celsius.

The MuniRem solution is currently available for use worldwide.

ARA Inc supported our evaluation of the optimized MuniRem reagent applied to degrade the different types of CWA simulants.