

RTA Press Release

Real-Time Analyzers wins US Army Contract for portable Raman analyzer to identify chemical agents in bottles

In the spring of 2008, a subcontractor for the US Army invited a large group of Manufacturers of field-portable Raman analyzers to demonstrate their ability to measure unknown chemicals in glass bottles. The US Army needed such an analyzer to identify chemical warfare agents in bottles that do not have labels, so that they can be properly destroyed in accordance with the 1993 Chemical Weapons Convention. From the 1920s to the 1960s, the Department of Defense produced over 100,000 chemical agent identification sets (CAIS) to train military personnel to identify and safely handle chemical warfare agents. Although most of these have been destroyed, the labels have fallen off of a significant number of the CAIS bottles making it impossible to properly neutralize the unidentified samples that remain.

In the past decade, Raman spectroscopy has emerged as the ideal analytical tool to perform the type of measurements required for this project. This is due to the fact that no sample preparation is required and the bottles which contain very dangerous materials do not have to be opened to perform the identification.

Raman analyzers work by focusing laser light into a chemical in question (solid or liquid), in this case, through the glass walls of the bottle. The inelastic light scattering that occurs in the chemical is known as Raman scattering. Since every chemical produces a unique Raman signature, the contents are easily identified by matching the measured spectrum of the unknown to that of known compounds contained in a searchable spectral library.

The US Army had purchased Raman analyzers for this application in recent years, but found that frequently the samples fluoresced due to high energy lasers used in these analyzers. If a sample fluoresces, the Raman spectrum is lost and identify the chemical can not be determined.

During the initial phase of this competitive process, the subcontractor provided manufacturers with a list



of chemicals to measure that were known to fluoresce when using the Army's current analyzers. This screening process reduced the number of manufacturers that used lower energy lasers to meet the initial requirements to three.

The final selection phase was a live field demonstration of capabilities. The three companies took part in a head-to-head competition at the US Army's Edgewood Chemical Biological Center in April 2008. Measurements of chemical agents; distilled mustard, nitrogen mustard, lewisite, and toxic industrial chemicals; chloropicrin, cyanogen chloride, and phosgene, were performed. Real-Time Analyzers' portable Raman analyzer product, the **Chemical Identifier** (pictured above), was declared the winner. According to a spokesperson, the other products were unable to make some measurements due to a lack of spectral coverage, nor could they quantify the agents in mixtures due to a lack of spectral resolution and reproducibility.

Dr. Stuart Farquharson (President & CEO of Real-Time Analyzers, Inc.) offers an explanation as to why the PRA outperformed all of the competitors: "Other manufacturers have made compromises in instrument performance in order to provide portability. We have chosen to produce an interferometer-based portable Raman analyzer, to achieve the same quality of a laboratory analyzer, yet our analyzer is lightweight and rugged and can be used both in and outside of the laboratory setting without compromise."



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