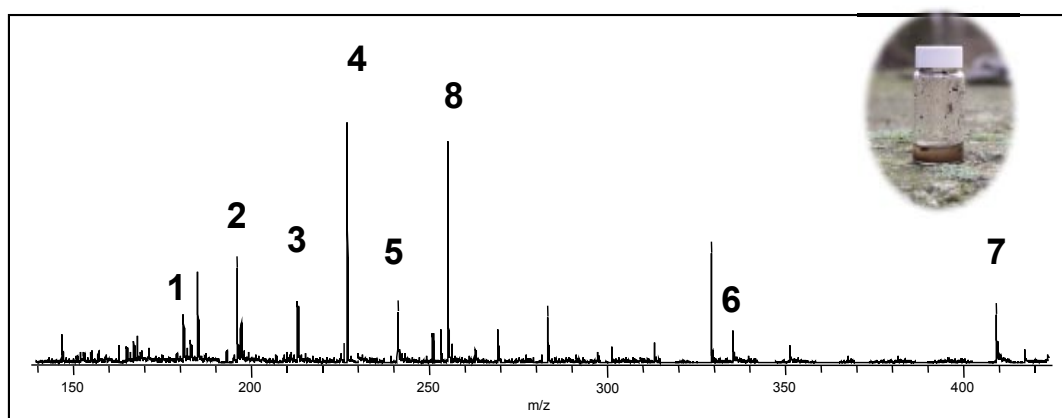


Detection of Explosives in Muddy Water

The AccuTOF time-of-flight mass spectrometer equipped with Direct Analysis in Real Time (DART™) has been used to detect a wide variety of explosives in or on a variety of materials ranging from solutions to samples deposited on surfaces ranging from ABS plastic to metal, clothing and cardboard. Detection is rapid, specific, and sensitive. To demonstrate DART's ability to detect explosives in a "messy" sample, we took a sample of muddy water from a frog pond in the woods near our laboratory. The water was spiked with 3 ppm

of an explosives mixture, mixed and allowed to stand. A glass rod was dipped into the spiked water solution and then placed between the DART and the first orifice of the AccuTOF atmospheric pressure interface. An aqueous solution of 0.1% trifluoroacetic acid was placed under the glass rod to permit the formation of trifluoroacetate adducts for HMS and RDX. The results are shown in the figure below. The total time for analysis was 20 to 30 seconds.



Explosives detected in muddy water.

*1: dinitrotoluene (DNT) 2: amino-DNT, 3: trinitrobenzene, 4: trinitrotoluene (TNT)
5: tetryl 6: RDX (TFA adduct) 7: HMS (TFA adduct) 8: Palmitate (in pond water).*

Some Explosives Analyzed by DART

- Sodium perchlorate
- Nitroglycerin (NG)
- Ethylene glycol dinitrate (EGDN)
- Dinitrotoluene (DNT)
- Amino-dinitrotoluene (DNT)
- Trinitrobenzene
- Hexamethylenetriperoxidodiamine (HTMD)
- Triacetone triperoxide (TATP)
- Trimethylenetrinitramine (RDX)
- Tetramethylenetetra nitramine (HMX)
- Picrylmethylnitramine (Tetryl)
- Pentaerythritol tetranitrate (PETN)