



B18 Identification by GC/MS of Aldicarb (Temik) in a Murder for Hire Case

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After attending this presentation, attendees will learn from a demonstration of a technique for the analysis of thermally labile compounds by GC/MS.

This presentation will impact the forensic community and/or humanity by expanding the forensic chemist ability to deal with thermally labile compounds.

The forensic chemist is often presented with requests for which their available instrumentation and methodologies do not seem readily applicable. This presentation will demonstrate the ability to identify the thermally labile compound, aldicarb by GC/MS when other technologies such as LC/MS and/or derivitization are not available. To accomplish this, techniques published by L. Chambers et al., Tel Aviv University¹ were modified.

Officers from the Mississippi Bureau of Investigation presented the laboratory with an unknown black granular material contained in emptied amoxicillin capsules. They informed the laboratory that these capsules were part of a murder for hire case in a neighboring county and requested that the laboratory screen for and identify any poison that might be present.

Initial analysis of the material by GC/MS, an Agilent MSD 5973 interfaced with an Agilent 6890N GC with a 30 meter HP5 column, indicated the presence of aldicarb oxime and aldicarb nitrile, which are thermal breakdown products of aldicarb, the poison contained in the cotton pesticide "Temik". This GC/MS information along with visual comparison of the unknown with descriptions of the pesticide found on the internet was sufficient for law enforcement to obtain an arrest warrant for the suspect.

"Temik" is a pesticide produced by Bayer CropScience containing aldicarb as the active ingredient. Other trade names for aldicarb include ENT 27093, OMS 771, Sanacarb, UC 21149, and Ambush. It is used as a pesticide in various applications on a variety of plants from cotton and soybeans to peanuts and potatoes. Aldicarb is an extremely hazardous Category I carbonate poison with an LD 50 of 1 milligram per kilogram. Given the amount contained in the two capsules was 1.4 grams and "Temik" is 15% aldicarb by weight, it was determined that there was 210 milligrams of aldicarb present in the two submitted capsules. This would be a sufficient amount of the poison to easily kill an average 70 kilogram individual. A sample of aldicarb (Temik) was obtained from a local farm chemical supply house to use as a standard. As aldicarb (Temik) can be absorbed dermally, orally or by inhalation, distribution of the pesticide is handled by a sealed *Lock & Load* system which minimizes human contact with the material.

Upon studying the methodology of L. Chambers et al., confirmation of the parent compound was done by installing a short 4 meter HP5 column on a Hewlett Packard GCD II, increasing the carrier gas flow rate and lowering the injector and column temperatures. These conditions allowed us to identify aldicarb by limiting the compound's time within the column and getting it through the system before it was thermally degraded. Retention time and mass spectra from the standard material was compared to that in the unknown and allowed us to positively identify the submitted material. The mass spectra of the standard sample and unknown also matched that of published standard spectra for aldicarb.

The usual method for analyzing thermally labile compounds makes use of LC/MS or derivitization. When these are not available application of the techniques in this presentation offers the forensic chemist other options for analysis of such compounds.

References

1. www.flworkshop.com/2002/chambers.pdf#search='analysis%20of%20aldicarb%20in%20under%205%20minutes'

Aldicarb, Analysis, GC/MS