



D63 Criminal Misuse of Peroxide Explosives — Case Study From the United Kingdom

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After attending this presentation, attendees will understand the experiences of peroxide explosives cases in the United Kingdom.

This presentation will impact the forensic community and/or humanity by demonstrating to laboratories who deal with explosives an appreciation of sharing the experiences of peroxide explosives cases in the UK, especially the development of a method for detecting trace levels of HMTD/TATP and presenting this evidence in court.

This presentation will concentrate on the work of the Forensic Explosives Laboratory (FEL) on one peroxide explosives case from the year 2000. Peroxide explosives are very sensitive primary high explosives that can be detonated by, for example, flame, impact and friction. The two organic peroxides most commonly encountered at the FEL are TATP (triacetone triperoxide) and HMTD (hexamethylene triperoxide diamine). The first encounter of the criminal misuse of such explosives in the UK is believed to have been in 1994 when an explosion occurred in a motor vehicle in a Jewish community. It is suspected that TATP was used as the initiator for the main charge in this explosives device, when as part of the police investigation approximately 1kg of TATP was recovered from a self-storage unit in London. Since then the FEL has dealt with a number of cases involving the criminal misuse of TATP and HMTD, in one such case the suspect had died while preparing HMTD.

The case to be presented started in November 2000 when a large quantity of sodium chlorate weedkiller, hexamine fuel tablets, citric acid and hydrogen peroxide were discovered in a small business unit by police in Birmingham, England following a large surveillance operation. These chemicals include the ingredients for the manufacture of HMTD (hexamine, acid and hydrogen peroxide). Subsequently a number of other properties in the same area were searched, with one property in particular revealing a large quantity of chemicals including HMTD powder and five improvised detonators containing HMTD. The following aspects of this case will be discussed:

- The role of FEL scientists at the crime scenes and their liaison with EOD (Explosive Ordnance Disposal) personnel and police exhibits officers.
- Significant items submitted to the laboratory.
- Procedures for examination and analysis of items. Including the need to develop a new method for the detection of trace levels of HMTD, not previously carried out at the FEL. This was achieved using the technique of LC/MS.
- Presenting the evidence from the FEL at the trial of two defendants at Birmingham Crown Court.

The results of the chemical analysis confirmed that HMTD had been found in one of the properties searched, including in the improvised detonators. A quantity of lead azide (another sensitive primary explosive) and small quantities of mixtures containing sulphur and sodium chlorate weedkiller were also identified in the items submitted. Sulphur/chlorate mixtures are extremely hazardous improvised pyrotechnic compositions due to their potential to spontaneously ignite. Trace levels of HMTD were also identified in samples from various items, for example, items of clothing.

It was concluded that the items submitted to the laboratory, including HMTD, lead azide, sulphur/chlorate mixtures and improvised detonators, indicated a serious and successful attempt to produce a wide range of explosive materials, which each posed a significant risk to public safety. They also had the potential to cause serious injury and possibly death and/or serious damage to property if directed against specific targets. The items submitted also included the chemicals to manufacture TATP (hydrogen peroxide, acetone and acid). However, no TATP or any reference to it was identified in the items examined.

Peroxide Explosives, Detection of Trace Levels, Presenting Evidence in Court