

FORENSIC SCIENCE
IV SEMESTER
UNIT -IV

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Extraction of Explosives

- The exhibits received in connection with pre-blast and post-blast cases are subjected to a detailed systematic analysis.
- The analysis of explosive residues can be sub-divided in to two parts: the analysis of post-explosion residues and the detection and identification of traces of explosives on suspect's hands, clothing and other related items.

EXTRACTION

- Extraction of debris by organic solvents transfers the explosive residues into the solution. Further concentrated and tested.

A. Organic solvent extraction:

- Acetone is universally accepted broad-spectrum solvent.
- Other organic solvents like ether, benzene and chloroform are also used, which are suitable for certain groups of organic explosives (nitro aromatic and some nitrate ester like EGDN or NG).
- The explosives like the heterocyclic nitramines, RDX and HMX are practically insoluble in these solvents. (Solubility: RDX-8.2 g/100gm, HMX-2.9 gm/100gm both at 25° C, PETN 20.3 gm/100gm at 20°C).
- Sometimes methanol or other solvents or their mixtures may be used instead of acetone.
- The extracts are concentrated and subjected to various analytical tests for detection and identification of organic explosives.

B. Water Extract:

- The residue left after acetone extract is treated with hot water and filtered.
- The inorganic residue dissolves readily in hot water.
- The water extract is concentrated to a small volume.
- Chemical and other analytical tests are performed for the detection of water soluble ingredients.

C. Alkali Extract:

- The residues left after water extraction often include metals, sulphides of arsenic and antimony, etc.
- A small portion of the dried material is extracted with 2N NaOH and filtered.
- The filtrate is preserved for the detection of sulphide, arsenic, antimony, aluminum, etc.

D. Pyridine Extract:

- The residue left after the above extraction is dried and extracted with pyridine and filtered.
- The extract is preserved for the detection of elemental sulphur.

Detection & identification of explosives

• Preliminary examination

- Preliminary examination of the whole sample is carried out for odour, colour, consistency and any visually observables ingredients.
- Ingredients with characteristic odour such as mononitrotoulene may often be detected at this stage.
- The colour and consistency may guide to find the general type of particular explosive .
- Some ingredients such as blown off aluminum can be readily identified by their characteristic appearance.
- Visible contaminants can also be observed at this stage.