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PRESENTATION ON

ANALYSIS OF LOW EXPLOSIVES AND POST BLAST RESIDUES BY CHEMICAL METHODS

CUFS 2416 EXPLOSIVE AND POST BLAST INVESTIGATION

B.Sc. Forensic Science (Sem 6)

School of Forensic Sciences
Bhubaneswar Campus

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INTRODUCTION

Explosives are solid, liquid or gaseous substance which, when suitably initiated, suffer rapid decomposition with liberation of heat and production of large volume of gas at high pressure.

Low Explosive : A relatively slow-burning explosive, usually set off by heat or friction, used for propelling charges in guns or for ordinary blasting.



COLLECTION OF EXPLOSIVE MATERIAL

Collection explosive material from explosion area by different methods-

- Swabbing
- Collection of soil
- Unexploded explosive
- Wrapper of explosive material

EXTRACTION OF EXPLOSIVE

Organic solvent extract: Acetone is universally accepted broad-spectrum solvent for majority of organic explosives

Water extract: The residue left after acetone extract is treated with hot water and filtered.

Alkali extract: The residues left after water extraction often include metals, sulphides of arsenic and antimony, Sulphur carbon etc.

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.

CHEMICAL TEST FOR LOW EXPLOSIVE

- Chemical test for anions

	Reagents	Procedure	Result
Test for chloride	Reagent A : - HNO_3 Reagent B: - Silver nitrate aqueous solution	1. Take 1 ml of water extract in test tube + 2-3 drops of reagent A + 2-3 drops of reagent B	White precipitate indicate the presence of chloride ion

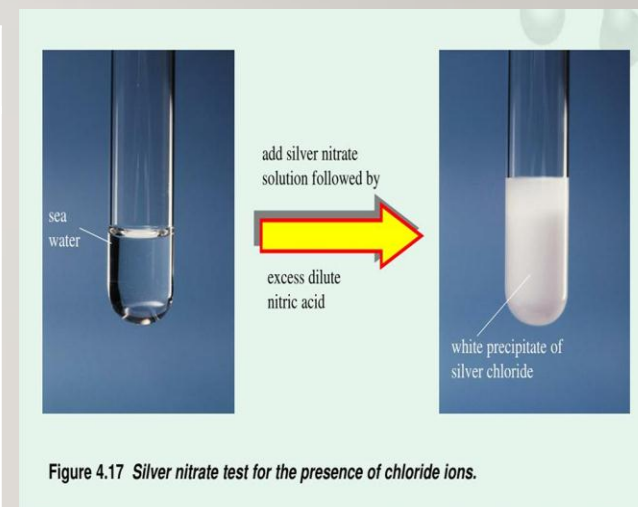


Figure 4.17 Silver nitrate test for the presence of chloride ions.

	Reagents	Procedure	Result
Test for sulphate ion	Reagent A: - Dilute HCl. Reagent B:- Barium chloride	1. Take 1 ml of extract+2-3 drops of reagent A+ water bath at 100 degree C for 5 min+ 2-3 drops of reagent B.	A white crystalline precipitate indicates the presence of sulphate ion



	Reagents	Procedure	Result
Test for Nitrate	Reagent A: sulphanic acid treated with acetic acid. Reagent B: alpha – naphthylamine	Take 1 drop of extract+ 1 drop of reagent A+ 1 drop of reagent B+ zinc dust	Pink to red color indicates the presence of Nitrate.



	Reagents	Procedure	Result
Test for Nitrite	Reagent A:- sulphanic acid treated with acetic acid. Reagent B:-alpha naphthylamine solution.	Take 1 drop extract in spot plate + 1 drop of reagent A+ 1 drop of reagent B	Pink to red color indicates the presence of Nitrite

	Reagents	Procedure	Results
Test for Phosphate ion	Reagent A: Acidified Ammonium molybdate aqueous solution. Reagent B: Benzidine in glacial acetic acid and dilute with water	Take 1 drop of water extract in spot plate + 1 drop of reagent A+ 1 drop of reagent B (wait 30 sec)+ 3 drops of saturated solution of sodium acetate.	Blue gray color indicates the presence of phosphate

CHEMICAL TESTS FOR CATIONS

	Reagents	Procedure	Result
Test for Calcium	Reagent A: aqueous solution of Sodium rhodizonate. Reagent B: Sodium Hydroxide	Take 1 drop of extract in spot plate + 1 drop of reagent A + 1 drop of reagent B .	A violet precipitate indicates the presence of calcium

	Reagents	Procedure	Result
Test for Antimony	Reagent A: Rhodamine-B solution	Take small portion of NaOH extract in spot plate + 1-2 drops of conc. HCl+ sodium nitrite + 10 drops of reagent A and mix	Red to violets indicates presence of Antimony.

	Reagents	Procedure	Result
Test for Strontium ion	Reagent A: aqueous solution of sodium rhodizonate	Take 1 drop of extract in spot plate + 1 drop of reagent A.	A brownish red coloration or precipitated.

	Reagents	Procedure	Result
Test for Potassium ion	Reagent A: Dipicrylamine solution. The solution soaked in a paper	Take 1 drop of water extract in a reagent A soak paper + 2 drops of HNO ₃	A red stain at the site of spot and other parts of reagent paper is bright yellow.

	Procedure	Result
Test for Arsenic (Reinsch's test)	Take extract of explosive substance + conc. HCl+ add porcelain ball heat (10-15 minutes) then add acidified bright copper foil.	Bright copper change to grey film of copper arsenide



FLAME TEST

Take water extract in a beaker then evaporate to dryness and cool + conc. HCl
Perform flame test by platinum wire in the non-luminous flame of the burner.

Colored Fire Spray Bottles



lithium
pink



strontium
red



potassium
violet



sodium
yellow



calcium
orange



copper(II)
green

SPOT TEST

- **Mercury Fulminate**

- 1 drop of sample + 1 drop of Vanadium pentoxide + 1 drop of conc. HCl in spot plate= If mercury fulminate present gives violet color

- **Lead Azide:**

- Dissolve sample in saturated ammonium acetate solution + 1 drop of Freshly prepared Ferric chloride solution + 1 drop of HCl in spot plate= color change red to decolorized indicates present of lead azide.



THANK YOU