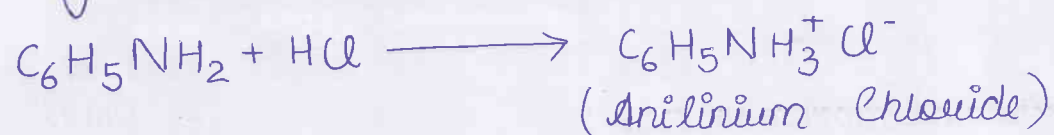
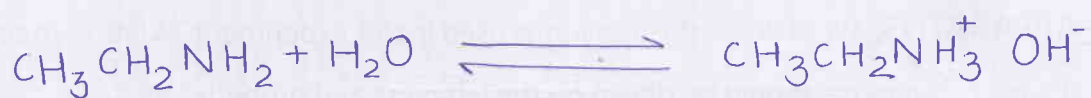


Solubility Test



Litmus Test



Coubylamine Test



EXPERIMENT 1

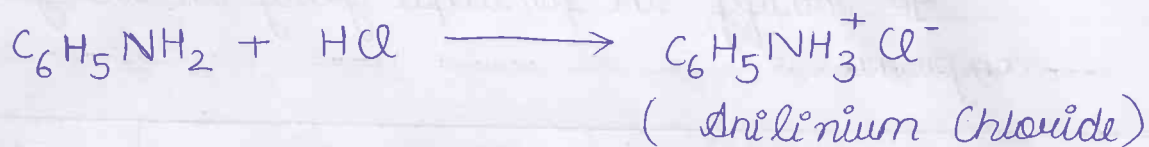
Aim :-

To identify the functional group in the given organic compound.

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	<u>Solubility Test</u> - Dissolve 1ml of given organic compound in 2ml of dilute acid HCl.	Organic liquid is soluble in acid.	-NH ₂ group possible.
2.	<u>Litmus Test</u> - Test with red litmus paper.	Red litmus turns blue.	-NH ₂ group possible.
3.	<u>Carbylamine Test</u> - Take 1ml of KOH in clean dry test tube + few drops of CHCl ₃ + 1-2 ml of given organic liquid + warm gently.	Unpleasant odour due to formation of isocyanide.	-NH ₂ group is confirmed. (Primary amine)
4.	<u>Nitrous Acid Test</u> - Mix 1-ml of HNO ₂ with 1ml of a given organic liquid.	Bubbles of N ₂ gas.	-NH ₂ group (primary amine) is confirmed.
5.	<u>Azodye Test</u> - Take 1ml of given organic liquid in a clean dry benzene diazonium chloride.	Red	

Teacher's Signature : _____

Solubility Test



Litmus Test



Carbylamine Test



Nitrous Acid Test



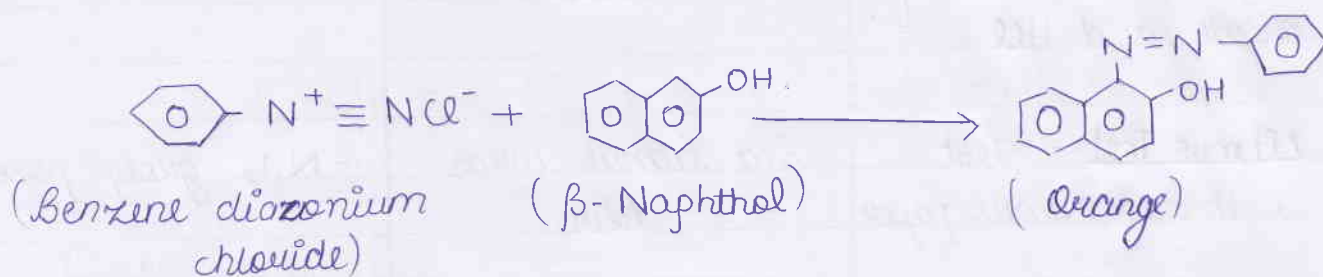
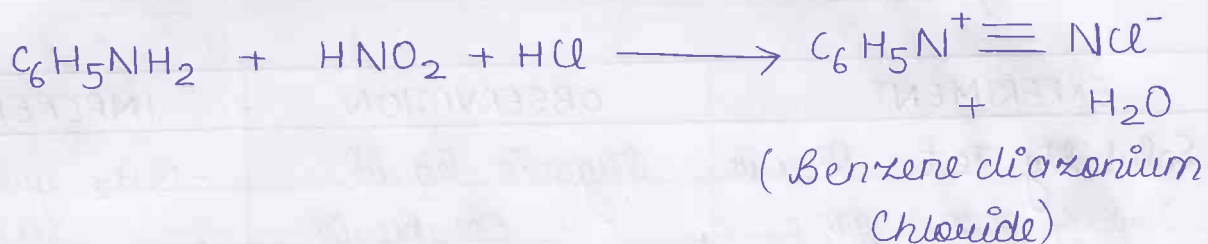
EXPERIMENT 1

Aim : To identify the functional group in the given organic compound.

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	Solubility Test - Dissolve 1ml of given organic compound in 2ml of dilute acid HCl.	Organic liquid is soluble in acid.	-NH ₂ group possible.
2.	Litmus Test - Test with red litmus paper.	Red litmus turns blue.	-NH ₂ group possible.
3.	Carbylamine Test - Take 1ml of KOH in clean dry test tube + few drops of CHCl ₃ + 1-2 ml of given organic liquid + warm gently.	Unpleasant odour due to formation of isocyanide.	-NH ₂ group is confirmed.
4.	Nitrous Acid Test - Mix 1-ml of HNO ₂ with 1 ml of a given organic liquid.	Bubbles of N ₂ gas.	-NH ₂ group (primary amine) is confirmed.

Teacher's Signature : _____

Azodye Test



S.No.	EXPERIMENT	OBSERVATION	INFERENCE
5.	<u>Azodye Test</u> - Take 1ml of given organic liquid in a clean dry test tube add Benzene diazonium chloride. Mix the solution with a solution of β -Naphthol.	Red colour dye is obtained.	$-\text{NH}_2$ group is confirmed. (Only by aromatic amine)

Result : The given organic compound contain Amino group ($-\text{NH}_2$).

Precautions :-

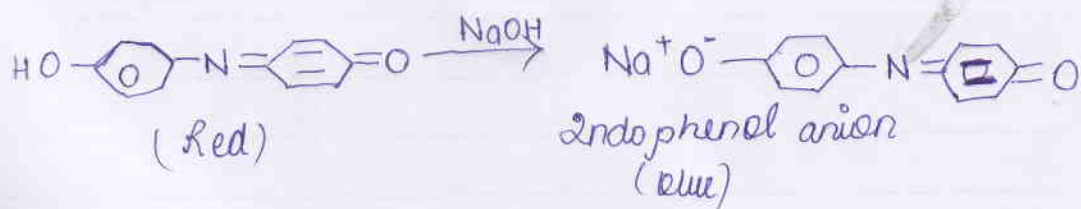
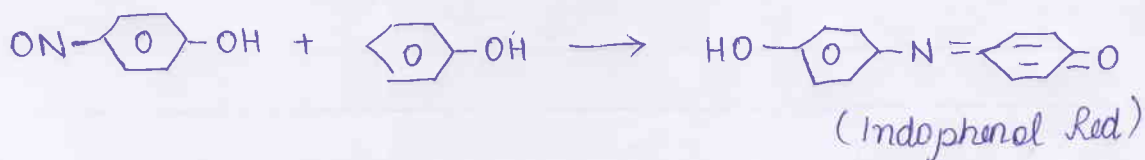
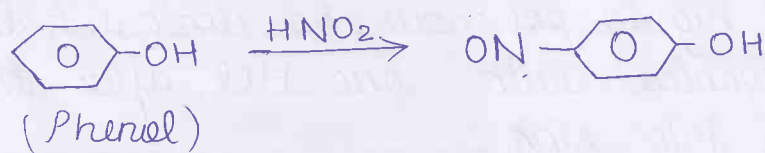
- (i) Isocyanide is highly poisonous. So, don't inhale it's vapour.
- (ii) Destroy isocyanide with conc. HCl after the test and then throw into sink.

Teacher's Signature : _____

Ferric Chloride Test



Liebermann's Test



EXPERIMENT 2

Aim : To identify the functional group in the given organic compound.

S.No	EXPERIMENT	OBSERVATION	INFERENCE
1.	Litmus Test - Place a drop of the given liquid on crystal or moist blue litmus paper.	Colour changes to red.	Phenolic group may be present.
2.	Ferric Chloride Test - Take 1ml of neutral ferric chloride solution in a clean test tube and add 2-3 drops of the liquid compound.	Violet colour appears.	Phenolic group is confirmed.
3.	Liebermann's Test - Place 2-3 crystals of NaNO_2 in a clean dry test tube and add about 1g of Phenol + heat very gently and cool. Add 1ml of conc. H_2SO_4 .	Deep-blue colour appears.	Phenolic group is confirmed.
4.	On adding water in blue coloured solution obtained.	Blue colour turns to red.	Phenolic group is confirmed.

Teacher's Signature : _____

S.No	EXPERIMENT	OBSERVATION	INFERENCE
5	<u>Bromine Water Test</u> : Add Bromine water in organic liquid.	white colour	Phenolic group is confirmed.

Result: The given organic compound contains phenolic group (Ar-OH)

Precautions :-

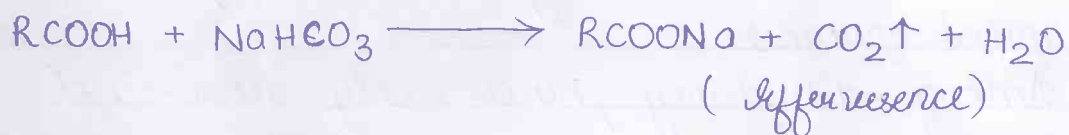
- (i) Liebermann's Test is not given by nitrophenol and p-substituted phenols.
- (ii) Among dihydroxy phenols, only resorcinol give positive test.

Teacher's Signature : _____

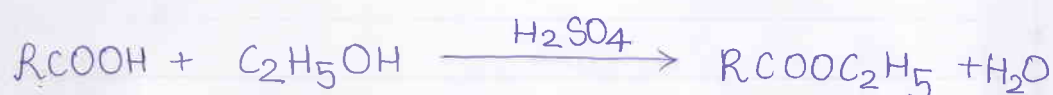
litmus Test



Sodium Bicarbonate Test



Ester Test



EXPERIMENT 3

Aim : To identify the functional group in the given organic compound.

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	Litmus Test - Place a drop of the given liquid on a moist blue litmus paper & observe, the change in colour.	Colour changes to red.	(Carboxylic group) -COOH may be present.
2.	Sodium bicarbonate Test - To 1ml of organic compound/liquid in a test tube, add a pinch of Sodium bicarbonate (NaHCO_3)	Buisk effervescence.	Carboxylic group (-COOH) is confirmed.
3.	Ester Test - Take about 0.1g of the organic compound, 1ml of ethyl alcohol and 1-2 drops of conc. H_2SO_4 in a test tube. Heat it on a water bath. Pour the reaction mixture in a beaker containing water.	A fruity smell is observed.	Carboxylic group (-COOH) is confirmed.

Teacher's Signature : _____

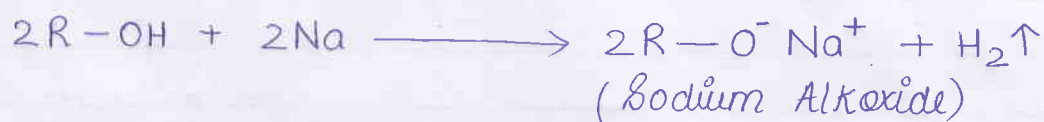
Result : The given organic compound contains Carboxylic group (-COOH).

Precautions :-

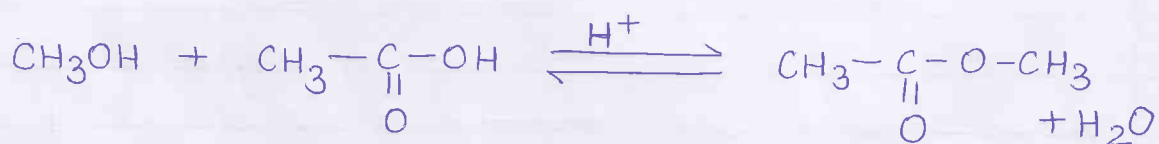
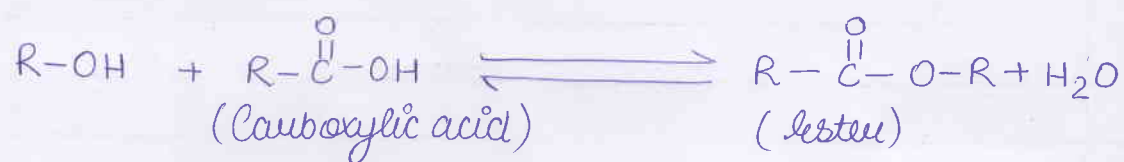
- (i) Carboxylic acid shows pungent smell. Hence, do not inhale more.
- (ii) In ester formation reaction mixture catches fire. Hence, heat gently.

Teacher's Signature : _____

Sodium Metal Test



Ester Test



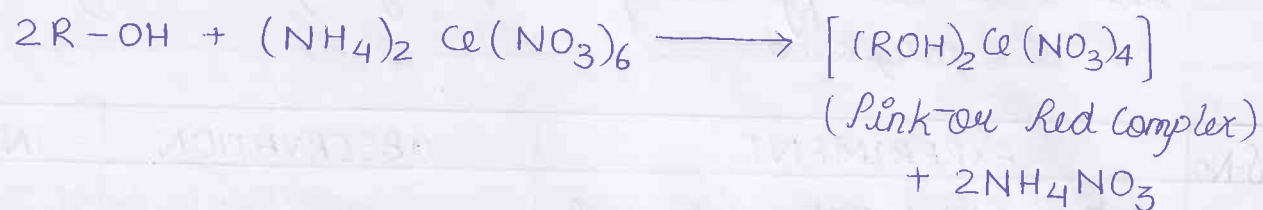
EXPERIMENT 4

Aim : To identify the functional group in the given organic compound.

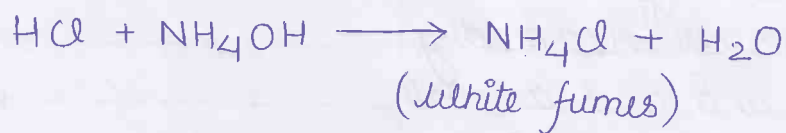
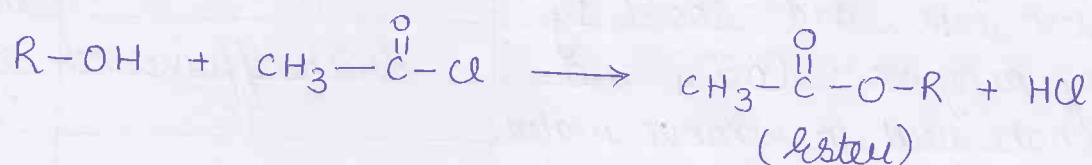
S.No	EXPERIMENT	OBSERVATION	INFERENCE
1.	Sodium Metal Test - Take 1ml of the given pure liquid in a dry test tube. Add, about 1g of anhydrous CaSO_4 and shake well to remove water. Filter or decant off the liquid to another clean dry test tube and add a small piece of Sodium metal.	Brisk effervescence	(R-OH) Alcoholic group may be possible.
2.	Ester Test - Take 1ml of the given liquid in a clean dry test tube, add 1ml of glacial acetic acid and 2-3 drops of conc. Sulphuric acid. Warm the mixture on a water bath for about 10 minutes. Pour it into about 10ml of cold water taken in a beaker & smell.	Fruity smell.	Alcoholic group may be present (R-OH).

Teacher's Signature : _____

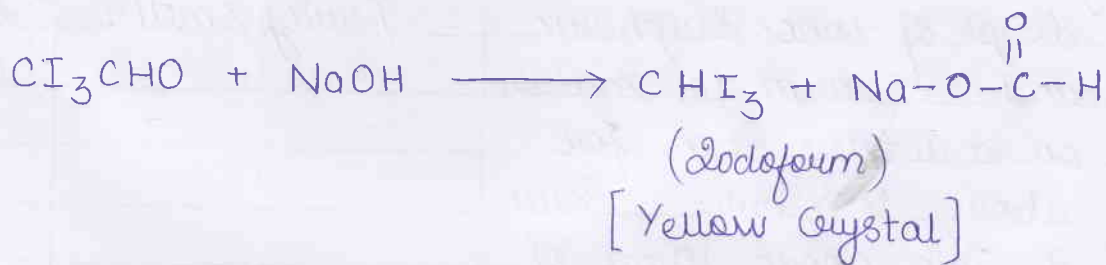
Ceric Ammonium Nitrate Test



Acetyl Chloride Test



Iodoform Test



S.No.	EXPERIMENT	OBSERVATION	INFERENCE
3.	<u>Ceric Ammonium Nitrate Test</u> Place about 1ml of the given compound in a clean dry test tube. Add a few drops of Ceric ammonium nitrate reagent and shake well.	Appearance of pink or red colour.	Alcoholic group is present. (R-OH)
4.	<u>Acetyl Chloride Test</u> - Take about 2ml of the given compound in a clean dry test-tube, add 1g. of anhydrous Calcium Sulphate and shake well. Filter, and to the filtrate add 2-3 drops of acetyl chloride, shake and bring a glass rod dipped in ammonium hydroxide solution near the mouth of the test tube.	Formation of white fumes.	Alcoholic group is present. (R-OH).
5.	<u>Iodoform Test</u> - Take 1ml of the given compound in a clean dry test tube and add 1ml of 1% Iodine solution. Then add dil. NaOH solution drop-wise until the brown colour of Iodine is discharged. Warm gently on water bath.	Yellow precipitate	Alcoholic group is present. (R-OH)

Teacher's Signature : _____

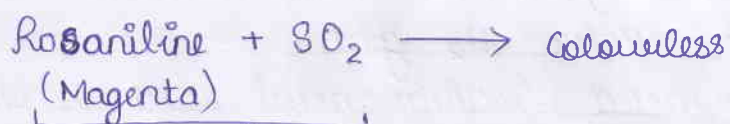
Result : The given organic compound contains alcoholic group.

Precautions :-

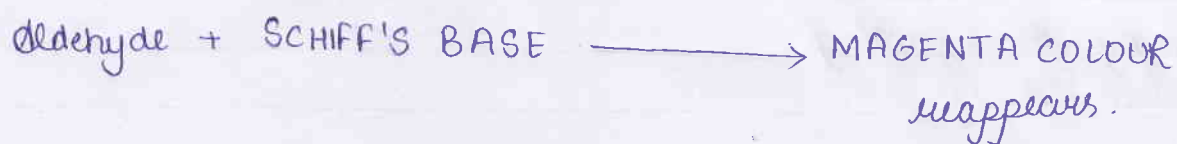
- (i) The alcohol should be pure. As, water also reacts with Sodium metal to evolve H_2 gas.
- (ii) Do not throw unreacted Sodium metal into the sink or dustbin. Add more alcohol to the unreacted Sodium to complete reaction.

Teacher's Signature : _____

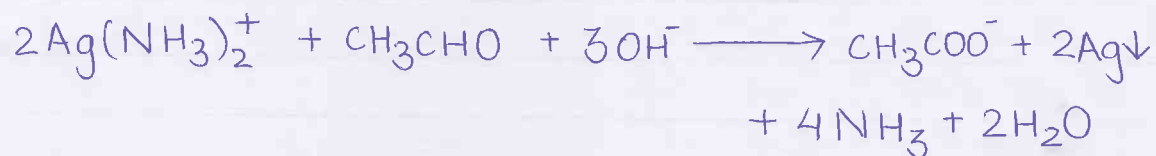
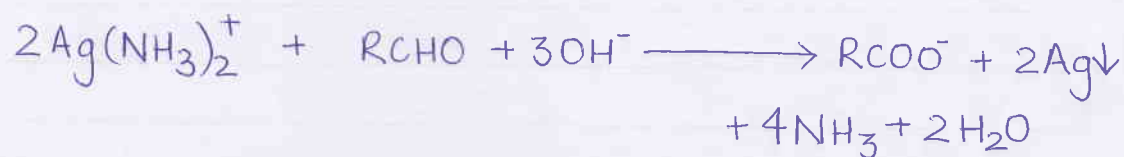
SCHIFF'S TEST



↓



Tollen's Test



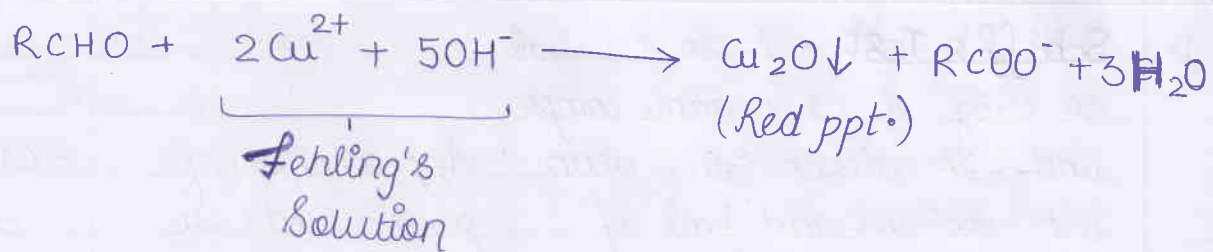
EXPERIMENT 5

Aim: To identify the functional group in the organic compound.

S.No	EXPERIMENT	OBSERVATION	INFERENCE
1-	<u>Schiff's Test</u> - Dissolve 0.5ml or 0.5g of the organic compound in alcohol in a clean test tube and add 1ml of Schiff's reagent. Shake and note the change in colour.	Appearance of pink, red or magenta colour.	-CHO group is confirmed.
2-	<u>Tollen's Test</u> - Take 1ml of silver nitrate solution in test tube + 2-3ml of dil. NaOH solution. Add ammonia solution dropwise until the brown ppt. of silver oxide just dissolve. To this add 3-4 drops of the given compound and warm the test tube on a water bath for 5 minutes.	A shining mirror is observed.	-CHO group is confirmed.

Teacher's Signature : _____

Fehling's Test



S.No.	EXPERIMENT	OBSERVATION	INFERENCE
3.	<u>Fehling's Test</u> - Take 1ml each each of Fehling's Solution A and Fehling's Solution B in a test tube. Add 4-5 drops (0.2g) of the given compound and warm the test tube in water bath for 4-5 min.	Appearance of red precipitate.	-CHO group is confirmed.

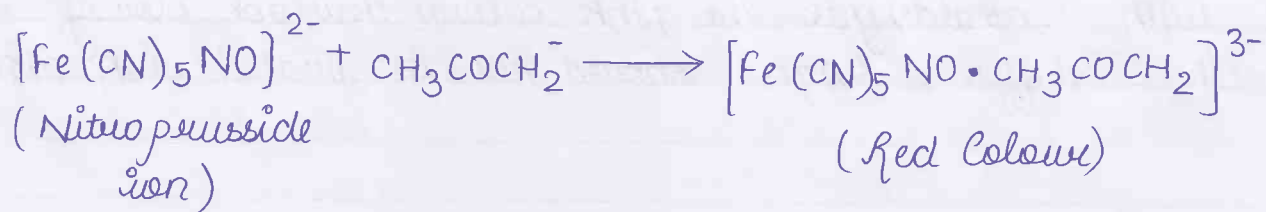
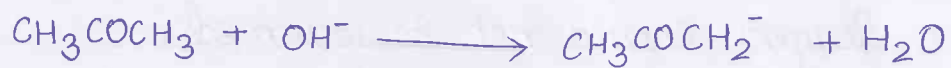
Result: The given organic compound contains aldehydic group (-CHO).

Precautions :-

1. Schiff's Reagent should not be warmed.
2. With Benzaldehyde the pink colour develops slowly.
3. The Schiff's Reagent should not be treated with alkalis.

Teacher's Signature : _____

Sodium nitroprusside Test



EXPERIMENT 6

Aim: To identify the functional group in the given organic compound.

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	<u>m-Dinitrobenzene Test</u> - Place 0.5ml of the given organic compound in a clean test tube + 0.1g of finely powdered m-dinitrobenzene. Now, add 1ml of Sodium hydroxide solution and shake.	Violet colour appears which slowly fades.	Ketonic group $(R-\overset{\overset{O}{ }}{C}-R)$ may be possible.
2.	<u>Sodium nitroprusside test</u> - Dissolve a crystal of Sodium nitroprusside in about 1ml of distilled water in a clean test tube + 0.5 ml of the organic compound. Shake and add Sodium hydroxide solution dropwise.	Red colourisation.	Confirms Ketonic group.

Result: The given organic compound contains Ketonic $(R-\overset{\overset{O}{||}}{C}-R)$ group.

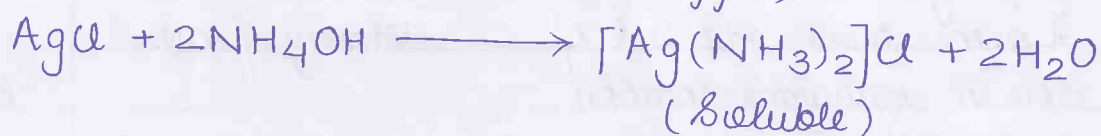
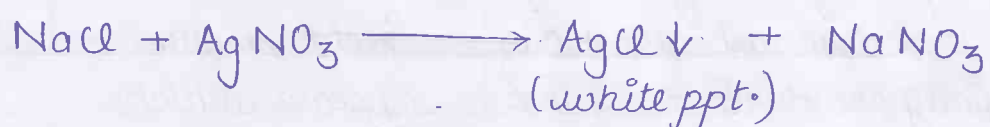
Precautions :-

1. Benzophenone doesnot give Sodium nitroprusside test and m-dinitrobenzene
2. Benzaldehyde give positive Sodium nitroprusside test.

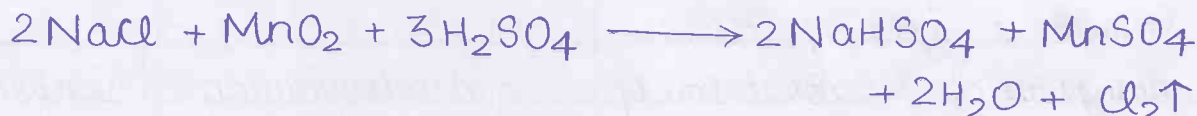
Teacher's Signature : _____

FOR ACIDIC RADICAL

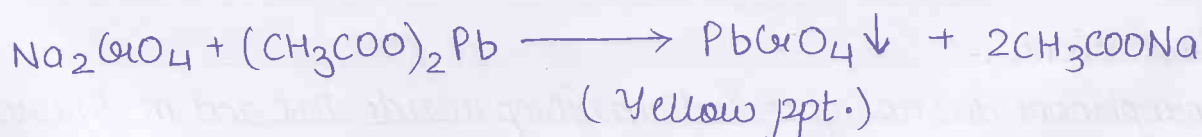
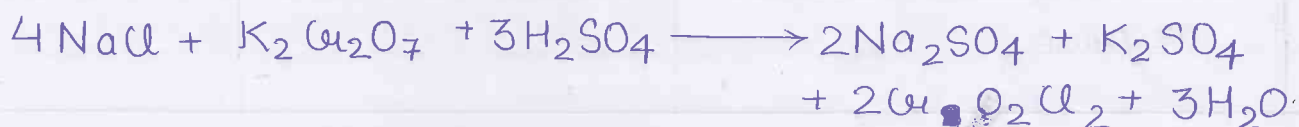
Silver Nitrate Test



MnO₂ test



Chromyl Chloride Test



EXPERIMENT 7

Aim : To determine the acidic and basic radical in the given inorganic salt.

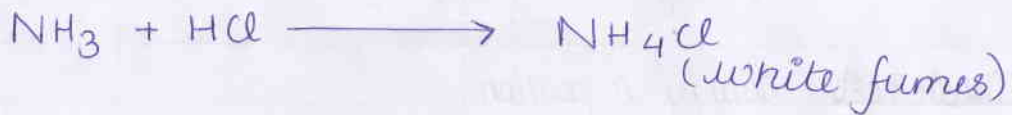
TEST FOR ACIDIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	Take a small quantity of salt in a test tube and add 1-2 ml of conc. H_2SO_4 .	Colourless gas with pungent smell.	Cl^- may be possible.
2.	<u>Silver Nitrate test</u> - Acidify a portion of aqueous solution with dil. HNO_3 . Boil it for some time, cool and add $AgNO_3$ solution.		
3.	<u>Manganese dioxide test</u> - Heat a pinch of the salt with small quantity of MnO_2 and conc. H_2SO_4 .	Evolution of greenish-yellow gas with pungent smell.	Cl^- confirmed.
4.	<u>Chromyl Chloride Test</u> - Mix a small quantity of salt with a small amount of powdered potassium dichromate. Take the mixture in a test tube and add conc. H_2SO_4 . Heat the tube and pass the red vapours evolved into the gas detector containing $NaOH$ solution. To yellow solution thus obtained, add dil. CH_3COOH and lead acetate solution.	A yellow precipitate.	Cl^- is confirmed

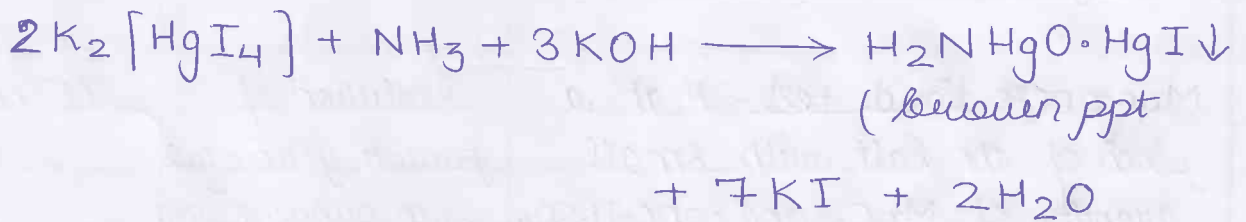
Teacher's Signature : _____

FOR BASIC RADICAL

Reaction Involved



Nessler Reagent



TEST FOR BASIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	The solid salt is heated with conc. solution of sodium hydroxide.	ammonia smell gas evolved.	Zero group present. NH_4^+ may be present.
2.	A glass rod dipped in dil. HCl is brought near the mouth of the test tube.	white fumes.	NH_4^+ confirmed.
3.	The gas evolved is passed through Nessler's reagent.	Brown ppt.	NH_4^+ confirmed.

Result : The given inorganic salt contains Cl^- as acidic radical and NH_4^+ as basic radical.

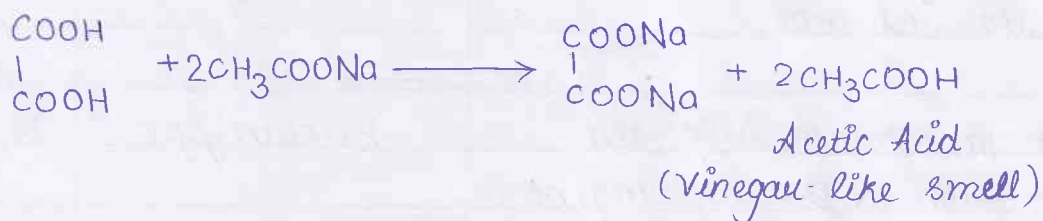
Precautions :-

1. Be careful while detecting the gas because Br_2 , I_2 , NO_2 also give pungent smell.
2. Use only conc. H_2SO_4 as dil. H_2SO_4 will not decompose the salt.

Teacher's Signature : _____

FOR ACIDIC RADICAL

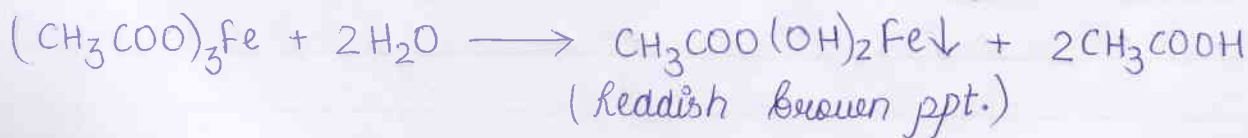
Oxalic Acid Test



Ester Test



Ferric Chloride Test



EXPERIMENT 8

Aim: To determine the acidic and basic radical in the given inorganic compound.

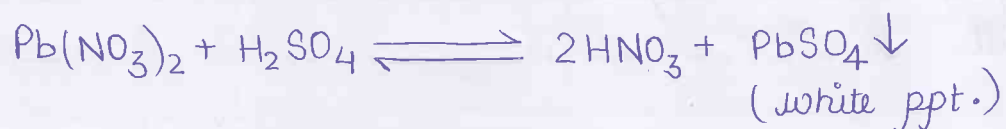
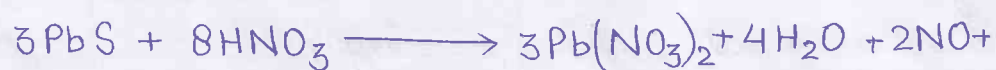
TEST FOR ACIDIC RADICAL

No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	Take a small quantity of a salt in a watch glass. Mix it with solid oxalic acid. Prepare paste of it with a few drops of water. Rub the paste and smell.	Smells like a vinegar.	CH_3COO^- may be possible.
	Ester Test - Take a small quantity of the salt in a test tube. Add conc. H_2SO_4 (2ml) and now add ethyl alcohol (1ml), shake. Pour the content of the test tube in a beaker full of water and stir it.	Pleasant fruity smell of ester.	CH_3COO^- is confirmed.
	Ferric Chloride Test - Take water extract of the salt. Add neutral ferric chloride solution. Filter it and divide the filtrate into two portions.		
	To one part, add dil. HCl .	Reddish colour disappear	CH_3COO^- confirmed.
	To second part, add water and boil.	Reddish brown ppt.	CH_3COO^- confirmed.

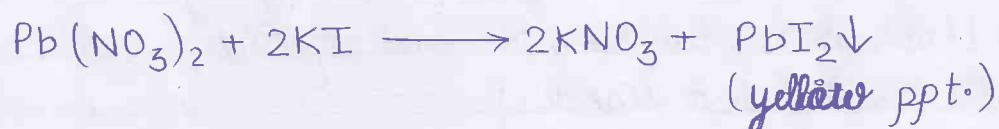
Teacher's Signature : _____

FOR BASIC RADICAL

Reaction Involved



Potassium Iodide Test



Potassium Chromate Test



TEST FOR BASIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	The solid salt is heated with conc. NaOH.	No ammonia smell.	Zinc group absent.
2.	Original solution + dil. HCl	white precipitate.	I group present.
3.	Heat the white ppt. with distilled water and divide the solution into two half :-		
(i)	Potassium Iodide Test - To one part add KI solution. The ppt. dissolves in boiling water and on cooling.	Yellow ppt.	Pb^{2+} is confirmed.
(ii)	Potassium Chromate Test - To another part add K_2CrO_4 solution. Dissolve it in NaOH solution.	Yellow ppt.	Pb^{2+} confirmed.

Result : In the given salt, acidic radical is (CH_3COO^-) and basic radical is (Pb^{2+}) .

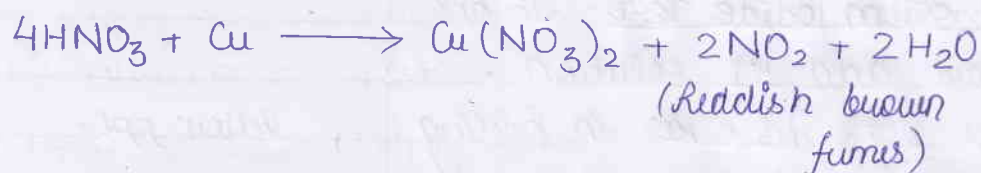
Precautions :-

- If the original solution is prepared in cold and dil. HCl first group is absent.
- Add HNO_3 gently.

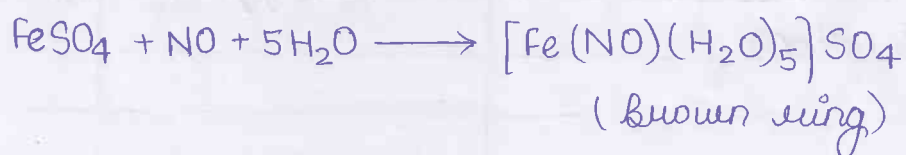
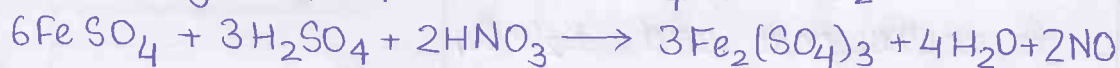
Teacher's Signature : _____

FOR ACIDIC RADICAL

Copper Test



Ring Test



EXPERIMENT 9

Aim: To identify acidic and basic radical in the given inorganic salt.

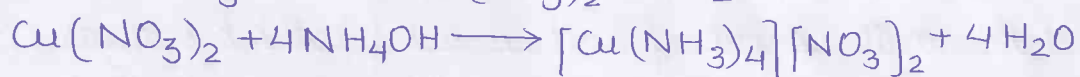
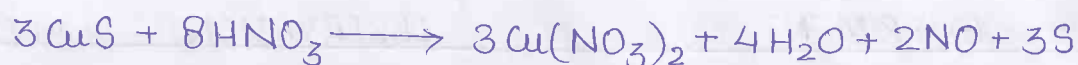
TEST FOR ACIDIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	Take small amount of salt in test tube and add (2-3ml) conc. H_2SO_4	Reddish-brown gas with pungent smell.	NO_3^- may be possible.
2.	Diphenylamine Test - Add a few drops of diphenylamine to a part of aqueous solution of the salt.	A deep blue colour is obtained.	NO_3^- group is confirmed.
3.	Copper Chips Test - Heat a small quantity of the original salt with conc. H_2SO_4 and a few copper chips.	Dark brown fumes.	NO_3^- group confirmed.
4.	Ring Test - Add a small quantity of the freshly prepared solution of $FeSO_4$ to a part of the aqueous solution of salt and then pour conc. H_2SO_4 slowly along the sides of the test tube.	A dark ring is formed.	NO_3^- group confirmed.

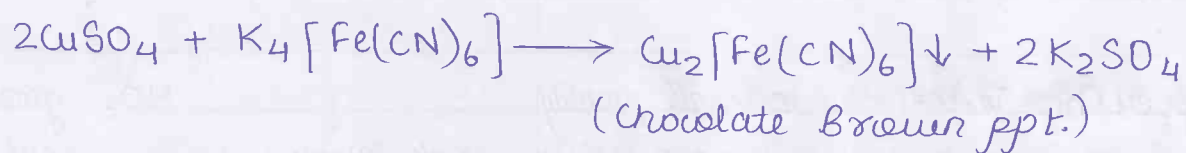
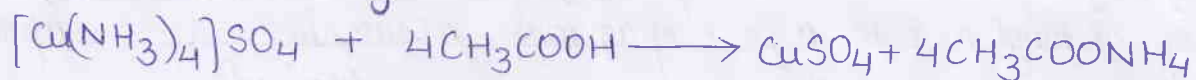
Teacher's Signature : _____

FOR BASIC RADICAL

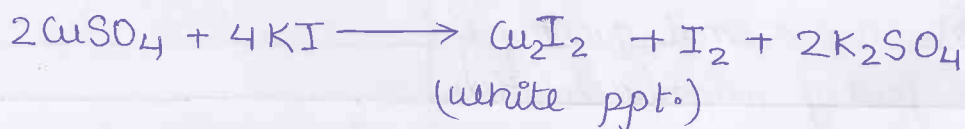
Reaction Involved



Potassium Ferrocyanide Test



Potassium Iodide Test



TEST FOR BASIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	The salt is heated with conc. NaOH.	no ammonia gas evolved.	Group Two absent.
2.	To the inorganic salt add dil. HCl.	No. ppt	Group I absent
3.	To the above solution add little dil-HCl and pass H_2S gas.	Black ppt. formed.	Group II present Cu^{2+} possible.
4.	Heat the black ppt. with 50% HNO_3 . ppt. dissolve. And separate in two parts.		
	First part + dil. H_2SO_4 and alcohol.	No white ppt.	Cu^{2+} possible.
5.	To rest of the solution add NH_4OH in excess	Blue-coloured solution	Cu^{2+} possible.
6.	<u>Potassium ferrocyanide Test</u> - To blue solution add acetic acid and Potassium ferrocyanide solution.	Chocolate brown precipitate.	Cu^{2+} is confirmed.
7.	<u>Potassium iodide Test</u> - Add acetic acid & potassium iodide solution.	white ppt. in brown-colour solution	Cu^{2+} confirmed.

Teacher's Signature :

Result : The given inorganic salt contain NO_3^- as acidic radical and Cu^{2+} as basic radical.

Precautions:-

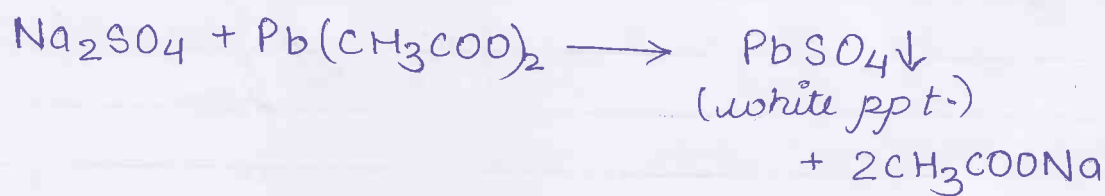
- (i) Don't treat salt with a large quantity of dilute acid.
- (ii) Don't boil the salt with concentrated H_2SO_4 . On boiling the acid may decompose to give SO_2 gas.

FOR ACIDIC RADICAL

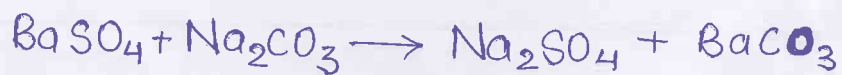
Barium chloride Test



Lead Acetate Test



Match Stick Test



EXPERIMENT 10

Aim: To identify acidic and basic radical in the inorganic salt.

TEST FOR ACIDIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	Take a small quantity of salt in a test-tube and add 1-2 ml of dilute H_2SO_4 .	No gas	—
2.	Take a small quantity of salt and treat it with 2-3 ml of conc. H_2SO_4 .	No gas	Either SO_4^{2-} or PO_4^{3-} possible
3.	Salt + HCl + Heat. Filter, the contents and to filtrate add few drops of $BaCl_2$ solution.	White ppt. Insoluble in conc. HCl.	SO_4^{2-} possible.
4.	Lead Acetate Test - To part of aqueous solution of the salt add lead acetate solution.	A white ppt.	SO_4^{2-} confirmed.
5.	Match Stick Test - Mix a small amount of the salt with Sodium Carbonate and a little powdered charcoal so as to get a paste. Take some paste on one end of wooden splinter & heat in the reducing flame. Dip the fused mass into Sodium Nitro prusside solution.	Violet streaks are produced.	SO_4^{2-} confirmed.

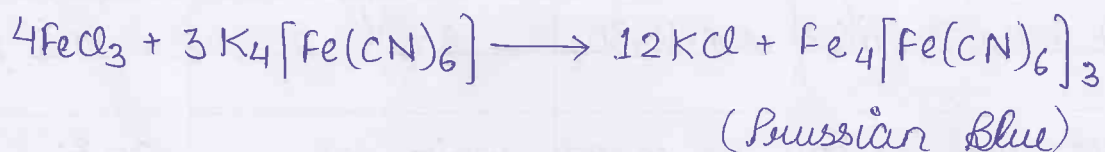
Teacher's Signature : _____

FOR BASIC RADICAL

Reaction Involved



Potassium ferrocyanide Test



Potassium sulphocyanide Test



TEST FOR BASIC RADICAL

S.No	EXPERIMENT	OBSERVATION	INFERENCE
1.	The salt is heated with conc. NaOH.	No ammonia gas evolved.	Group zero absent.
2.	The salt is treated with dil. HCl.	No ppt.	Group I absent.
3.	To the salt add little dil HCl & pass H_2S gas.	No ppt.	Group II absent.
4.	Salt + HNO_3 and boil it. Then, add 2g of NH_4Cl and boil it. Add excess of NH_4OH and shake it.	ppt. formed (Reddish brown)	Group III present. Fe^{3+} maybe possible.
5.	Dissolve the reddish brown ppt. in dil HCl and divide the solution into two parts -		
(i)	Potassium Ferricyanide Test - In above solution add Potassium Ferricyanide solution.	Prussian blue colour.	Fe^{3+} confirmed.
(ii)	Potassium Sulphocyanide Test - To another part, add a little Potassium Sulphocyanide solution.	Blood Red colour.	Fe^{3+} confirmed.

Teacher's Signature :

Result :- The given inorganic salt contains SO_4^{2-} as acidic and Fe^{3+} as basic radical.

Precautions :-

1. Use sufficient quantity of ammonium chloride, otherwise hydroxide of higher group may be precipitated.
2. Add NH_4OH until solution gives smell of ammonia.

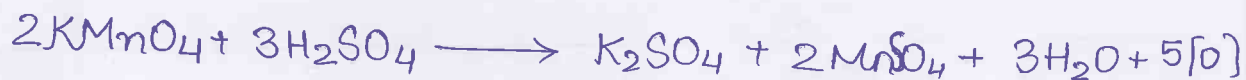
Teacher's Signature : _____

FOR ACIDIC RADICAL

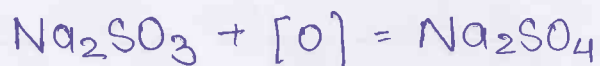
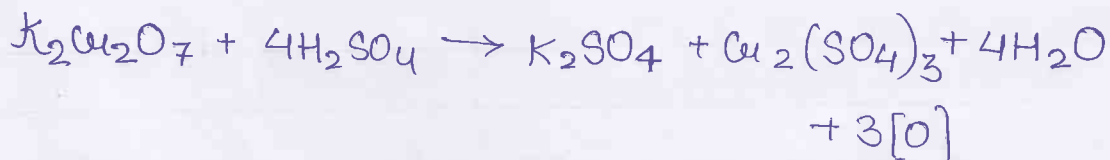
Barium Chloride Test



Potassium Permanganate Test



Potassium dichromate Test



EXPERIMENT 11

Aim: To identify acidic and basic radical in given inorganic salt.

TEST FOR ACIDIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	Take a small quantity of salt in test tube and add 1-2ml of dil. H_2SO_4 .	Colourless gas with Pungent smell.	SO_3^{2-} possible.
2.	Barium Chloride Test - Take a portion of aqueous solution of salt and add Barium Chloride solution to it. Filter, to a portion of the above ppt. add dil. HCl	white ppt. ppt. dissolve with evolution of SO_2	SO_3^{2-} confirmed. SO_3^{2-} confirmed
3.	$KMnO_4$ Test - To ppt. obtained above add few drops of acidified Potassium Permanganate solution.	Pink colour is discharged.	SO_3^{2-} confirmed.
4.	$K_2Cr_2O_7$ Test - To a portion of aqueous solution of salt add Potassium dichromate solution acidified with dil. H_2SO_4 .	Green colour is obtained.	SO_3^{2-} confirmed.

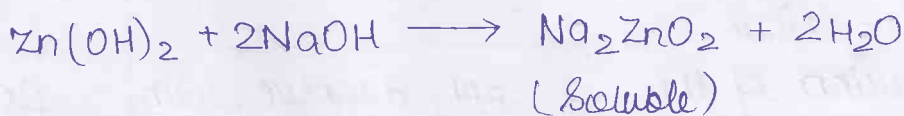
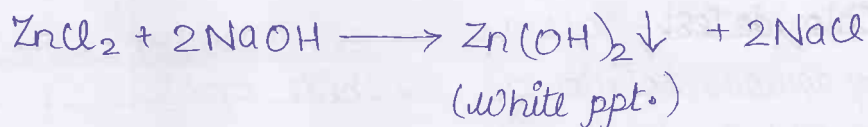
Teacher's Signature : _____

FOR BASIC RADICAL

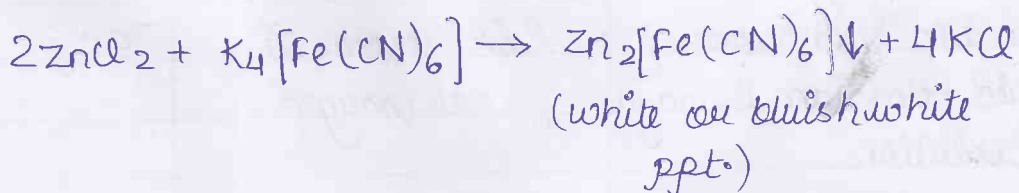
Reaction Involved



Sodium Hydroxide Test



Potassium Ferricyanide Test



TEST FOR BASIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	The salt is heated with conc. NaOH	No ammonia gas is evolved.	Group Zero absent.
2.	To the salt add dil. HCl.	No ppt.	Group I absent.
3.	To the salt add little dil. HCl and pass H_2S gas.	No ppt.	Group II absent.
4.	Salt + HNO_3 and boil it. Then, add 2g of NH_4Cl and boil it. Add excess of NH_4OH and shake it.	No ppt.	Group III absent.
5.	Take same ammoniacal solution and pass H_2S gas through it.	ppt. formed (dirty white)	Group IV present. Zn^{2+} maybe possible.
6.	<u>Sodium Hydroxide Test</u> - To a part of inorganic salt add NaOH solution dropwise. Add more of NaOH.	white ppt. white ppt. dissol - res.	Zn^{2+} confirmed.
7.	<u>Potassium ferrocyanide test</u> - To another part add Potassium ferrocyanide solution.	white or bluish white ppt.	Zn^{2+} confirmed.
8.	<u>Charcoal Cavity Test / Cobalt Nitrate Test</u> - Perform Charcoal Cavity test with the Salt.	Greenish residue.	Zn^{2+} confirmed.

Teacher's Signature : _____

Result: In the given inorganic salt SO_3^{2-} is acidic radical and Zn^{2+} is basic radical.

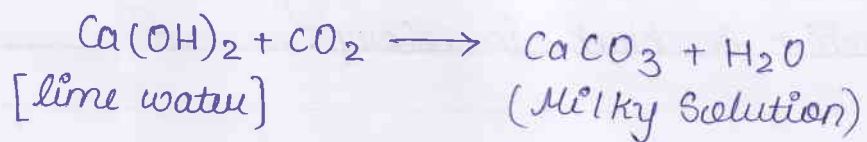
Precautions:-

- (i) Don't heat the salt with dil. acid.
- (ii) Don't put more than 2 drops of cobalt nitrate on the white residue. Excess cobalt nitrate may decompose to give cobalt oxide which is black in colour.

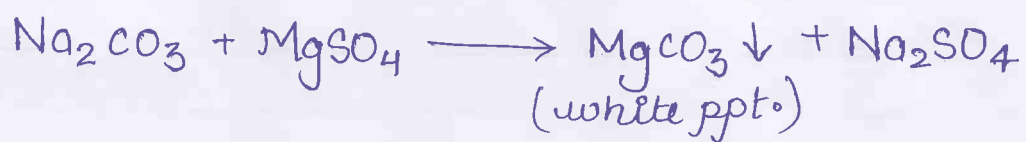
Teacher's Signature : _____

FOR ACIDIC RADICAL

Reaction with dil. HCl



Magnesium Sulphate Test



EXPERIMENT 12

Aim: To find acidic and basic radical in given inorganic salt.

TEST FOR ACIDIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	Take a small quantity of salt in a test tube & add 1-2 ml of dil. H_2SO_4	Colourless, odourless gas with brisk effervescence.	CO_3^{2-} possible.
2.	<u>Dilute HCl Test</u> - To one portion of the solution add dil. HCl and pass the gas in lime-water.	Gas will turn lime-water milky.	CO_3^{2-} confirmed.
	Gas passed in excess amount.	lime water becomes colourless.	CO_3^{2-} confirmed
3.	<u>Magnesium Sulphate Test</u> - To another portion of solution add magnesium sulphate solution.	white ppt.	CO_3^{2-} confirmed.

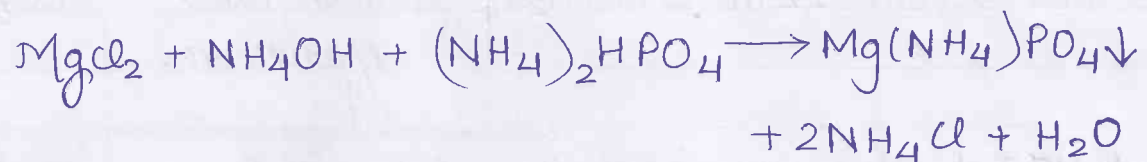
TEST FOR BASIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	Take a small quantity of salt & heat it with NaOH.	No ammonia gas evolved.	Group Zero absent.
2.	To the original solution add dil. HCl	No ppt.	Group I absent
3.	To original salt add little HCl and pass H_2S gas.	No ppt.	Group II absent.

Teacher's Signature : _____

FOR BASIC RADICAL

Ammonium Phosphate Test



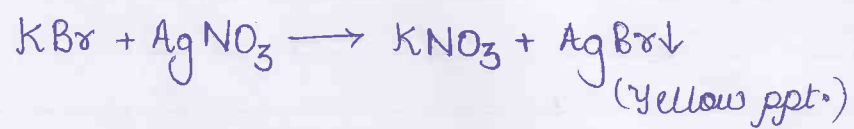
Result: The given inorganic salt contain CO_3^{2-} as acidic radical and Mg^{2+} as basic radical.

Precautions:-

1. Don't put more than 2 drops of Cobalt nitrate on white residue in Cobalt nitrate test.
2. Use dilute solution of Cobalt nitrate.

FOR ACIDIC RADICAL

Silver Nitrate Test



Manganese dioxide Test



Chlorine water Test



EXPERIMENT 13

Aim: To find acidic and basic radical in given inorganic salt.

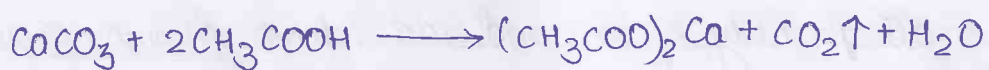
TEST FOR ACIDIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	Take small quantity of salt and add 2-3 ml of conc. H_2SO_4 .	Reddish-brown vapours with pungent smell.	Br^- possible.
2.	<u>Silver Nitrate Test</u> - Acidify a portion of aqueous solution with dil. HNO_3 . Boil, cool and add $AgNO_3$ solution.	A light yellow ppt.	Cl^- confirmed.
3.	<u>Manganese dioxide Test</u> - Heat a small quantity of salt with solid MnO_2 and conc. H_2SO_4 .	Yellowish-brown vapours.	Cl^- confirmed.
4.	<u>Chlorine Water Test</u> - Acidify a portion of aqueous solution with dil. HCl and add 1-2 ml of Carbon disulphide and then chlorine water. Shake vigorously & allow to stand.	Orange colour.	Br^- confirmed.

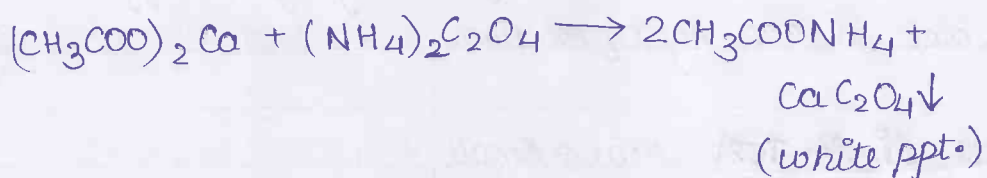
Teacher's Signature : _____

FOR BASIC RADICAL

Reaction Involved



Ammonium Oxalate Test



TEST FOR BASIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	The Salt is heated with conc. NaOH	No Ammonia gas evolved.	Group zero absent
2.	To the original salt add dil. HCl.	No ppt.	Group I absent.
3.	To the original salt's solution add little HCl and pass H_2S gas	No ppt.	Group II absent.
4.	Salt + HNO_3 and boil it. Then, add 2g. of NH_4Cl and boil it. Add excess of NH_4OH and shake it.	No ppt.	Group III absent.
5.	Take some ammoniacal solution and add H_2S gas into the solution	No ppt.	Group IV absent.
6.	Boil off H_2S completely and then add $(NH_4)_2CO_3$.	White ppt.	Group V present. Ca^{2+} may be possible.
7.	Dissolve the ppt. in hot dil. acetic acid.		
(i)	Ammonium Oxalate test- To the solution add 1-2ml of ammonium oxalate solution. Add NH_4OH and scratch the sides.	White ppt.	Ca^{2+} confirmed.
(ii)	Flame Test- Prepare a paste of the salt with conc. HCl and perform flame test.	Brick-red flame.	Ca^{2+} confirmed.

Teacher's Signature : _____

Result: In the given inorganic salt Bi^- is acidic radical and Ca^{2+} is basic radical.

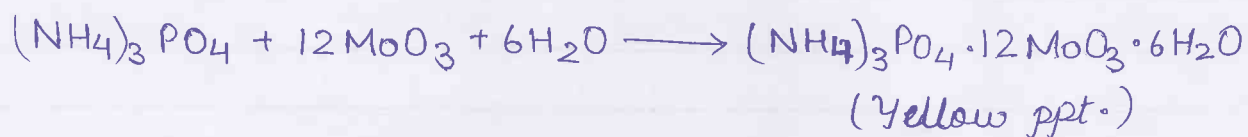
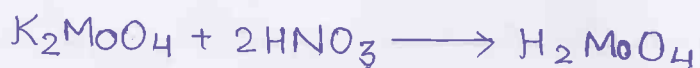
Precautions:-

1. Proceed to test for group V cations in order Ba^{2+} , Sr^{2+} and Ca^{2+} .
2. Original solution should be preferably used for testing Bi^{2+} and Ca^{2+} .

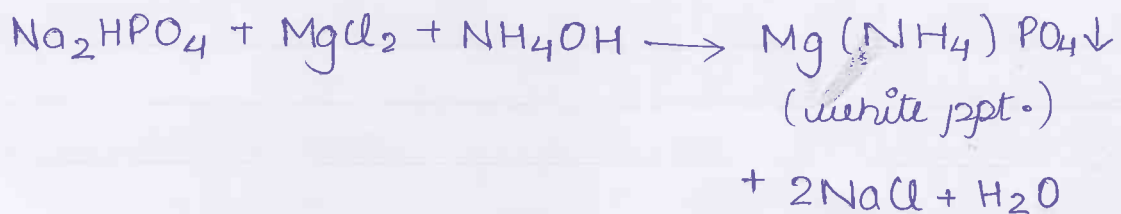
Teacher's Signature : _____

FOR ACIDIC RADICAL

Ammonium Molybdate Test



Magnesia Mixture Test



EXPERIMENT 14

Aim: To find acidic radical and basic radical in given inorganic salt.

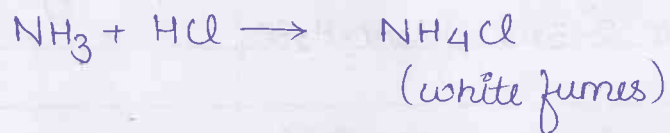
TEST FOR ACIDIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	Take a small quantity of salt in test tube and add 1-2 ml of dil. H_2SO_4 .	No gas.	—
2.	Take small quantity of salt in a test tube and add 2-3 ml of conc. H_2SO_4 .	No gas.	Either SO_4^{2-} or PO_4^{3-} possible.
3.	Add conc. HNO_3 to the salt. Boil the contents and add excess of ammonium molybdate solution.	Yellow ppt.	PO_4^{3-} present
4.	Solution of salt + conc. HNO_3 and boil. Add ammonium molybdate in excess and boil again.	Yellow ppt.	PO_4^{3-} confirmed
5.	Magnesium Mixture Test - Add Magnesia mixture in the aqueous solution and allow to stand.	White ppt.	PO_4^{3-} confirmed

Teacher's Signature : _____

FOR BASIC RADICAL

Reaction Involved



Nessler's Reagent Test

1. Don't need large quantity of salt solution.
2. NH_4^+ has very unpleasant smell, so smell the gas from considerable distance.

Teacher's Signature: _____

TEST FOR BASIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	The salt is heated with conc. NaOH.	gas with ammoniacal smell evolved.	Zero group present. NH_4^+ maybe possible
2.	Glass rod dipped in dil. HCl is brought near the mouth of test tube.	white fumes	NH_4^+ confirmed
3.	Gas evolved passed through Nessler's reagent	Brown ppt.	NH_4^+ confirmed.

Result: The given inorganic salt contain PO_4^{3-} as acidic radical and NH_4^+ as basic radical.

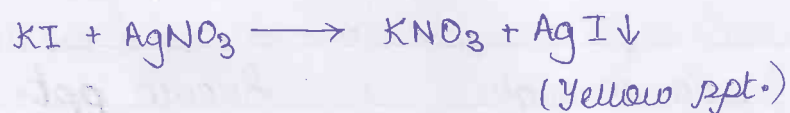
Precautions:-

1. Don't treat large quantity of salt with acid.
2. NH_4^+ has very unpleasant smell, so smell the gas from considerable distance.

Teacher's Signature : _____

FOR ACIDIC RADICAL

Silver Nitrate Test



Manganese dioxide Test



Chlorine water test



EXPERIMENT 15

Aim: To find acidic and basic radical in the given inorganic salt.

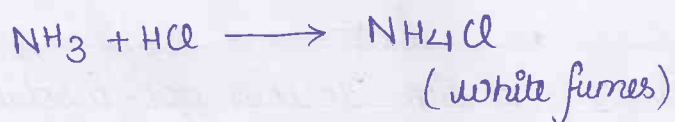
TEST FOR ACIDIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	Small quantity of salt is treated with conc. H_2SO_4 (2-3 ml) in a test tube.	Deep violet vapours with pungent smell.	I^- possible.
2.	Silver Nitrate Test - Aq. solution + dil. HNO_3 . Boil and cool and add $AgNO_3$ solution.	Yellow ppt. insoluble in NH_4OH .	I^- confirmed.
3.	Manganese dioxide test - Small quantity of salt is heated with a little MnO_2 and conc. H_2SO_4	violet vapours	I^- confirmed.
4.	Chlorine Water Test - Aq. solution + dil. HCl , add 1-2 ml of Carbon disulphide and then chlorine water. Shake vigorously, and allowed to stand.	Carbon disulphide layer acquires a violet colour	I^- confirmed.

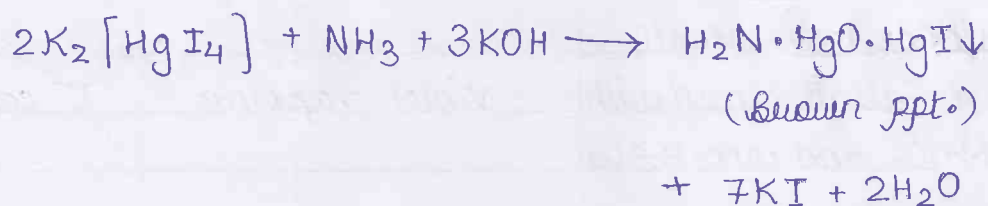
Teacher's Signature : _____

FOR BASIC RADICAL

Reaction Involved



Nessler's Reagent Test



TEST FOR BASIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	The salt is heated with conc. NaOH.	Ammoniacal smell gas evolved.	Zero group present. NH_4^+ may be possible.
2.	Glass Rod dipped in the HCl is brought close to test tube.	White fumes.	NH_4^+ confirmed.
3.	Gas evolved passed through Nessler's Reagent.	Brown ppt.	NH_4^+ confirmed.

Result: The given inorganic salt has I^- (acidic radical) and NH_4^+ (basic radical).

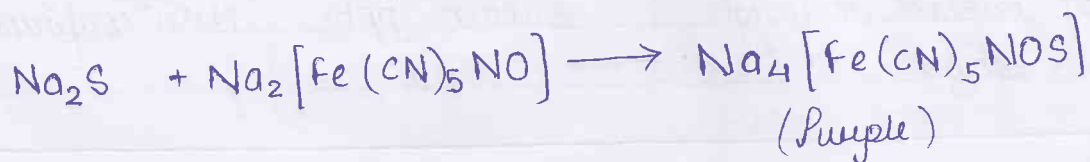
Precautions :-

1. Don't treat salt with large quantity of acid.
2. Don't boil the salt with conc. H_2SO_4 .

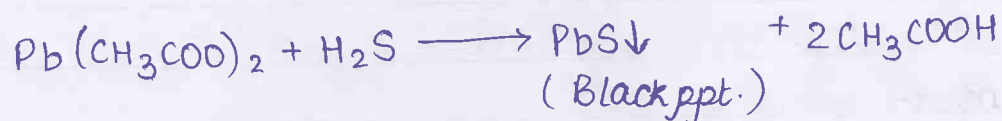
Teacher's Signature : _____

FOR ACIDIC RADICAL

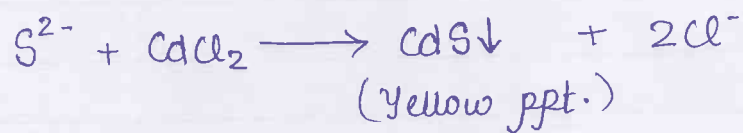
Sodium Nitroprusside Test



Lead Acetate Test



Cadmium Carbonate Test



EXPERIMENT 16

Aim: To identify the acidic radical and basic radical in the given inorganic salt.

TEST FOR ACIDIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	Small quantity of salt is treated with dil. H_2SO_4 (1-2ml) in a test-tube.	Colourless, rotten egg like smell gas.	S^{2-} may be possible.
2.	Sodium Nitroprusside Test - Aqueous Solution + few drops of Sodium nitroprusside solution in a test tube.	Purple or violet colour obtained.	S^{2-} confirmed.
3.	Lead Acetate test - Aqueous solution + lead acetate solution.	Black ppt.	S^{2-} confirmed.
4.	Cadmium Carbonate Test - Aqueous Solution + Suspension of Cadmium Carbonate in water.	Yellow ppt.	S^{2-} confirmed

Teacher's Signature : _____

TEST FOR BASIC RADICAL

[illegible]

Teacher's Signature : _____

TEST FOR BASIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	The salt is heated with conc. NaOH.	No ammonia gas evolved.	Group zero absent.
2.	To the salt, add dil. HCl.	No ppt.	Group I absent.
3.	To the salt, add little HCl and pass H_2S gas.	No ppt.	Group II absent.
4.	Salt + HNO_3 and boil it. Then, added 2g of NH_4Cl and boil it. Add excess of NH_4OH and shake it.	No ppt.	Group III absent.
5.	Taken same ammonical solution and add H_2S gas into solution.	ppt. formed.	Group IV present. Mn^{2+} may be possible.
6.	Filter the ppt. and washed with water.	Buff colour ppt.	Mn^{2+} present.
7.	Sodium Hydroxide / Bz test - • Salt + NaOH solution & shake. • Add Bz_2 water to white ppt.	white ppt. turns blackish brown.	Mn^{2+} confirmed.

Teacher's Signature : _____

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
8.	<u>Lead Peroxide Test</u> - To black ppt. obtained above acid conc. HNO_3 and lead peroxide. Boil, cool and allow to settle.	Pink - coloured solution.	Mn^{2+} confirmed.
9.	<u>Borax-Bead Test</u> - Perform Borax-Bead Test with Salt.	Pinkish bead in oxidising flame & colourless bead in reducing flame.	Mn^{2+} confirmed.

Result: The given inorganic salt contains S^{2-} as acidic radical and Mn^{2+} as basic radical.

Precautions :-

1. Don't treat the salt with a large quantity of dil. acid.
2. Don't heat the salt with dil. acid.

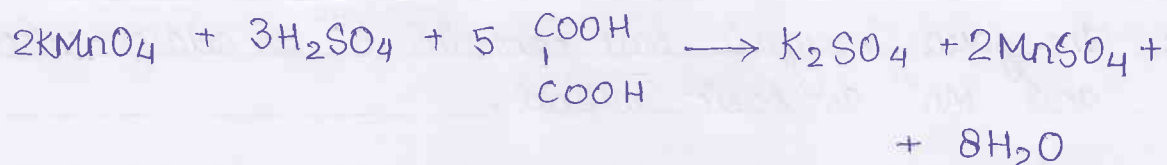
Teacher's Signature : _____

FOR ACIDIC RADICAL

Calcium chloride Test



Potassium Permanganate Test



EXPERIMENT 17

Aim: To identify acidic and basic radicals in given inorganic salt.

TEST FOR ACIDIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	Take small quantity of salt and add 2-3 ml conc. H_2SO_4 .	Colourless gas, burns with pale bluish flame	$Cu_2O_4^{2-}$ possible.
2.	Calcium Chloride Test - Take water extract, add small amount of dil. acetic acid and boil off CO_2 . Add Calcium chloride solution	white ppt.	$Cu_2O_4^{2-}$ possible. confirmed.
3.	Potassium Permanganate Test - Take a pinch of salt in test tube and add dil. H_2SO_4 , warm to $60-70^\circ C$ and add 2-3 drops of $KMnO_4$ solution.	Decolourisation of pink colour of $KMnO_4$ & evolution of CO_2 .	$Cu_2O_4^{2-}$ confirmed.

TEST FOR BASIC RADICAL

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
1.	Salt is heated with conc. $NaOH$.	No ammonia gas evolved.	Group zero absent.
2.	To the salt add dil. HCl .	No ppt.	Group I absent.
3.	To the salt add little dil. HCl & pass H_2S gas	No ppt.	Group II absent.

Teacher's Signature : _____

S.No.	EXPERIMENT	OBSERVATION	INFERENCE
4.	Salt + HNO_3 and boil it. Then, add 2g of NH_4Cl and boil it. Add excess of NH_4OH and shake it.	No ppt.	Group III absent.
5.	Take same ammoniacal solution and pass H_2S gas.	Black ppt.	Group IV present Ni^{2+} may be possible
6.	Filter the the ppt. and wash with water.	Greenish colour.	Ni^{2+} present.
7.	Dimethyl Glyoxime test - Salt + NH_4OH + few drops of dimethyl glyoxime.	Rose red ppt.	Ni^{2+} confirmed.
	Sodium Hydroxide / Br_2 -Test - Salt + NaOH + Br_2 water.	Black ppt.	Ni^{2+} confirmed.

Result : The given inorganic salt contains $\text{C}_2\text{O}_4^{2-}$ as acidic and Ni^{2+} as basic radical.

Precautions :-

1. Be careful while detecting $\text{C}_2\text{O}_4^{2-}$ because CO_3^{2-} also release gas which turns lime water milky.
2. Don't boil the salt with conc. H_2SO_4 . On boiling, it may decompose to give SO_2 gas.