(2018-19 +1 New syllabus) **Systematic Analysis of Given Simple Salt**

NO	Experiment	Observation	Inference
1.	**Colour:** Colour of the salt.	Blue /Green Brown Colourless	May be Copper salts May be an Iron(ferric) salt Absence of Copper and Iron Salts
2.	**Action of heat :** Little of the salt is heated in a dry test tube.	i)Reddish brown gas	May be Nitrate
		ii)Pungent smelling gas giving dense white fumes with glass rod dipped in conc. HCl	May be Ammonium
		iii)Yellow when hot, white when cooled.	May be Zinc
		No characteristic change	Absence of Nitrate, Ammonium and Zinc
3.	**Flame test :** Little of the salt is made into a paste with conc. HCl in a watch glass and it is burnt by the non luminous part of the Bunsen flame using a glass rod.	i) Brick red flame	Presence of Calcium
		ii) Apple green flame	Presence of Barium
		iii)Bluish green flame	Presence of copper
		iv)No characteristic flame	Absence of Copper, Calcium and Barium
4.	**Action of dil.HCl:** Salt + dil.HCl and heated.	i)Colourless, Odourless gas with brisk effervescence turning lime water milky	Presence of Carbonate confirmed
		ii)Rotten egg smelling gas turning lead acetate paper black.	Presence of Sulphide confirmed
		iii)Reddish brown gas with the fishy odour turning a moist ferrous sulphate paper brown	Presence of Nitrate
		iv)No characteristic change	Absence of Nitrate, Carbonate & Sulphide
5.	**Action of Conc.H_2SO_4:** Salt +Conc. H_2SO_4 +heated.	A colourless gas evolves. It gives a dense white fumes when a glass rod dipped in liquid ammonia is brought close to its mouth.	Presence of chloride
		A reddish brown gas turning moist fluorescein paper green evolves.	Presence of bromide

		Reddish brown gas turning acidified ferrous sulphate paper green evolves.	Presence of nitrate
		No characteristic change.	Absence of Chloride, Bromide & Nitrate
6.	**Action of MnO_2 and Conc. H_2SO_4:** Salt + MnO_2 + Conc. H_2SO_4 and heated.	A greenish yellow gas turning starch iodide paper blue evolves.	Presence of chloride
		A reddish brown gas turning moist fluorescein paper red evolves	Presence of Bromide
		No characteristic change.	Absence of Chloride, Bromide
7.	**Action of Conc.H_2SO_4Copper turning test:** Salt + Copper turnings + conc. H_2SO_4 and heated.	Reddish brown gas	Presence of Nitrate
		No reddish brown gas	Absence of Nitrate
8.	**Action of dil. NaOH:** Salt + dil. NaOH and heated	A colourless gas with the Pungent smelling gas with the smell of ammonia gives dense white fumes with rod dipped in conc.HCl.	Presence of Ammonium salt
		No Pungent smelling gas	Absence of Ammonium salt
9.	**Chromyl chloride test:** Salt + $K_2Cr_2O_7$ + Conc.H_2SO_4 and heated.	**Red orange vapours evolved** is passed through NaOH in a test tube. Yellow solution is obtained. On adding dil acetic acid and Lead acetate solution, yellow precipitate is formed.	Presence of Chloride confirmed
		No red orange vapours evolved	Absence of Chloride

Preparation of Sodium Carbonate extract :

Salt +Na_2CO_3 + distilled water, Boiled, Cooled and filtered. The clear filtrate is called sodium carbonate extract.

10	**Test for halides:** Extract + dil. HNO_3 + $AgNO_3$	i)Curdy white precipitate	Presence of Chloride
		ii)A pale yellow ppt	Presence of Bromide
		iii)Black precipitate	Presence of Sulphide
		iv)No characteristic precipitate	Absence of Chloride, Bromide and Sulphide

11	**$BaCl_2$ test:** Extract + dil. HCl +$BaCl_2$	White precipitate insoluble in dil H_2SO_4	Presence of Sulphate
		No white precipitate	Absence of Sulphate
12	**Lead acetate test:** Extract + CH_3COOH +Lead acetate	White precipitate soluble in ammonium acetate.	Presence of Sulphate
		No White precipitate	Absence of Sulphate
13	**Brown Ring test:** Extract + dil.H_2SO_4 + freshly prepared $FeSO_4$ and conc. H_2SO_4 is added along the sides of the test tube .	Brown ring is formed	Presence of Nitrate
		No brown ring is formed	Absence of Nitrate
14	**Ammonium molybdate test:** Extract + dil HNO_3 + ammonium molybdate and Conc. HNO_3	A canary yellow ppt is formed.	Presence of phosphate
		No yellow precipitate	Absence of phosphate
15	**Test with sodium nitro bruside:** Extract + dil .ammonia + sodium nitro bruside.	A purple or violet colouration appears	Presence of sulphide.
		No purple or violet colouration	Absence of suphide

Analysis of Basic Radicals

Preparation of Original Solution:

Salt + water (dil. HNO_3 or dil. HCl) gives original solution. ($CuCO_3$, $MgCO_3$, $CaCO_3$, ZnS salt used dil. HNO_3 or dilHCl)

1.	**Analysis Of Ammonium:** Original Solution + NaOH + Nessler's reagent	Chocolate brown precipitate	Presence of Ammonium (Group0)
		No chocolate brown precipitate	Absence of Ammonium

Group Separation

1.	Original Solution + dil. HCl	White precipitate	Presence of I group Lead
		No White precipitate	Absence of I group Lead
2.	Original Solution + dil. HCl+ H_2S gas is passed	Black precipitate	Presence of II group Copper
		No Black precipitate	Absence of II group Copper
3.	Original Solution + NH_4Cl + NH_4OH	White precipitate	Presence of III group Aluminium or Ferric iron.
		No White precipitate	Absence of III group Al Fe
4.	Original Solution + NH_4Cl + NH_4OH + H_2S gas is passed	Dirty white precipitate	Presence of IV group Zinc
		No dirty white precipitate	Absence of IV group Zinc
5.	Original Solution + NH_4Cl + NH_4OH + $(NH_4)_2CO_3$	White precipitate	Presence of V group Ba or Ca
		No White precipitate	Absence of V group Ba or Ca

6.	Original solution + NH_4Cl + NH_4OH + disodium hydrogen phosphate	White precipitate	Presence of VI group Magnesium
		No White precipitate	Absence of VI group Magnesium
	Confirmatory Test For Basic Radicals		
1.	**Lead (Group I)** Original solution + KI solution	Yellow precipitate	Lead is confirmed
2.	**Copper (Group II)** Original solution + Acetic acid + potassium ferrocyanide	Red brown precipitate	Copper is confirmed
3	**Aluminium (Group III)** Original solution + sodium peroxide + dil HCl	Gelatinous white ppt	Aluminium is confirmed
	Ferric Iron (Group III) Original solution + sodium peroxide + dil HCl + potassium ferrocyanide	Blue precipitate	Ferric iron is confirmed
4.	**Zinc (Group IV)** Original solution + potassium ferro cyanide	White precipitate	Zinc is confirmed
5.	**Barium (Group V)** Original solution + potassium chromate	Yellow precipitate	Barium is confirmed
6.	**Calcium (Group V)** Original solution+NH_4OH +Ammonium oxalate	White precipitate	Calcium is confirmed
7	**Magnesium (Group VI)** Original solution + NaOH + Magneson reagent	Blue precipitate	Magnesium is confirmed
8	**Ammonium (Zero group)** Original solution + NaOH + Nessler's reagent	Chocolate brown precipitate	Ammonium is confirmed

Result: The given simple salt contains

Acid radical_____Basic radical _____ The given simple salt is_____

List of salts

1. Lead Nitrate
2. Copper Sulphate
3. Copper Carbonate
4. Ferric Chloride
5. Zinc Sulphate
6. Zinc Sulphide
7. Aluminium Sulphate
8. Aluminium Nitrate
9. Calcium Carbonate
10. Barium Chloride
11. Ammonium Chloride
12. Ammonium Bromide
13. Magnesium Sulphate
14. Magnesium Carbonate
15. Magnesium Phosphate

NEW SYLLABUS 2018-19.

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1. LEAD NITRATE

NO	Experiment	Observation	Inference
1.	Colour of the salt	Colourless	Absence of Copper and Iron Salts
2.	**Action of heat :** Little of the salt is heated in a dry test tube	Reddish brown gas	May be Nitrate
3.	**Flame test :** Little of the salt is made into a paste with conc. HCl in a watch glass and it is burnt by the non luminous part of the Bunsen flame using a glass rod	No characteristic flame	Absence of Copper, Calcium and Barium
4.	**Action of dil.HCl:** Salt + dil.HCl and heated.	Reddish brown gas with the fishy odour turning a moist ferrous sulphate paper brown	Presence of Nitrate
5.	**Action of Conc.H_2SO_4:** Salt +Conc. H_2SO_4 +heated.	Reddish brown gas turning acidified ferrous sulphate paper green evolves.	Presence of nitrate
6.	**Action of MnO_2 and Conc. H_2SO_4:** Salt + MnO_2 + Conc. H_2SO_4 and heated.	No characteristic change.	Absence of Chloride, Bromide
7.	**Action of Conc.H_2SO_4Copper turning test:** Salt + Copper turnings + conc. H_2SO_4 and heated.	Reddish brown gas	Presence of Nitrate
8.	**Action of dil. NaOH:** Salt + dil. NaOH and heated	No Pungent smelling gas	Absence of Ammonium salt
9.	**Chromyl chloride test:** Salt + $K_2Cr_2O_7$ + Conc.H_2SO_4 and heated.	No red orange vapours evolved	Absence of Chloride

Preparation of Sodium Carbonate extract :

Salt +Na_2CO_3 + distilled water, Boiled, Cooled and filtered. The clear filtrate is called sodium carbonate extract.

10	**Test for halides:** Extract + dil. HNO_3 + $AgNO_3$	No characteristic precipitate	Absence of Chloride, Bromide and Sulphide
11	**$BaCl_2$ test:** Extract + dil. HCl +$BaCl_2$	No white precipitate	Absence of Sulphate
12	**Lead acetate test:** Extract + CH_3COOH +Lead acetate	No White precipitate	Absence of Sulphate
13	**Brown Ring test:** Extract + dil.H_2SO_4 + freshly prepared $FeSO_4$ and conc. H_2SO_4 is added along the sides of the test tube .	Brown ring is formed	Presence of Nitrate
14	**Ammonium molybdate test:** Extract + dil HNO_3 + ammonium molybdate and Conc. HNO_3	No canary yellow precipitate	Absence of phosphate
15	**Test with sodium nitro bruside:** Extract + dil .ammonia + sodium nitro bruside.	No purple or violet colouration appears	Absence of sulphide.
	Analysis of Basic Radicals		
	Preparation of Original Solution: Salt + water gives original solution.		
1.	**Analysis Of Ammonium:** Original Solution + NaOH + Nessler's reagent	No Chocolate brown precipitate	Absence of Ammonium (Group zero)
	Group Separation		
1.	Original Solution + dil. HCl	White precipitate	Presence of I group Lead
	Confirmatory Test -LEAD		
1.	**Lead (Group I)** Original solution + KI solution	Yellow precipitate	Lead is confirmed

Result: The given simple salt contains

i) Acid radical **Nitrate**

ii) Basic radical **Lead**

iii) The given simple salt is **Lead nitrate**

2. COPPER SULPHATE

NO	Experiment	Observation	Inference
1.	Colour of the salt	Blue	May be Copper salt
2.	**Action of heat :** Little of the salt is heated in a dry test tube	No characteristic change	Absence of Nitrate, Ammonium and Zinc
3.	**Flame test :** Little of the salt is made into a paste with conc. HCl in a watch glass and it is burnt by the non luminous part of the Bunsen flame using a glass rod	Bluish green flame	Presence of copper
4.	**Action of dil.HCl:** Salt + dil.HCl and heated.	No characteristic change	Absence of Nitrate, Carbonate & Sulphide
5.	**Action of Conc.H_2SO_4:** Salt +Conc. H_2SO_4 +heated.	No characteristic change.	Absence of Chloride, Bromide & Nitrate
6.	**Action of MnO_2 and Conc. H_2SO_4:** Salt + MnO_2 + Conc. H_2SO_4 and heated.	No characteristic change.	Absence of Chloride, Bromide
7.	**Action of Conc.H_2SO_4Copper turning test:** Salt + Copper turnings + conc. H_2SO_4 and heated.	No Reddish brown gas	Absence of Nitrate
8.	**Action of dil. NaOH:** Salt + dil. NaOH and heated	No Pungent smelling gas	Absence of Ammonium salt
9.	**Chromyl chloride test:** Salt + $K_2Cr_2O_7$ + Conc.H_2SO_4 and heated.	No red orange vapours evolved	Absence of Chloride

Preparation of Sodium Carbonate extract :

Salt +Na_2CO_3 + distilled water, Boiled, Cooled and filtered. The clear filtrate is called sodium carbonate extract.

10	**Test for halides:** Extract + dil. HNO_3 + $AgNO_3$	No characteristic precipitate	Absence of Chloride, Bromide and Sulphide
11	**$BaCl_2$ test:**Extract + dil. HCl +$BaCl_2$	White precipitate insoluble in dil.H_2SO_4	Presence of Sulphate
12	**Lead acetate test:** Extract + CH_3COOH +Lead acetate	White precipitate soluble in ammonium acetate.	Presence of Sulphate
13	**Brown Ring test:** Extract + dil.H_2SO_4 + freshly prepared $FeSO_4$ and conc. H_2SO_4 is added along the sides of the test tube .	No Brown ring is formed	Absence of Nitrate
14	**Ammonium molybdate test:** Extract + dil HNO_3 + ammonium molybdate and Conc. HNO_3	No canary yellow precipitate	Absence of phosphate
15	**Test with sodium nitro bruside:** Extract + dil .ammonia + sodium nitro bruside.	No purple or violet colouration appears	Absence of sulphide.
	Analysis of Basic Radicals		
	Preparation of Original Solution: Salt + water gives original solution.		
1.	**Analysis Of Ammonium:**Original Solution + NaOH + Nessler's reagent	No chocolate brown precipitate	Absence of Ammonium (Group zero)
	Group Separation		
1.	Original Solution + dil. HCl	No White precipitate	Absence of I group Lead
2.	Original Solution + dil. HCl+ H_2S gas is passed	Black precipitate	Presence of II group Copper
	Confirmatory Test - Copper		
	Copper (Group II) Original solution + Acetic acid + potassium ferrocyanide	Red brown precipitate	Copper is confirmed

Result: The given simple salt contains

i) Acid radical **Sulphate**

ii) Basic radical **Copper**

iii) The given simple salt is **Copper sulphate**

3. COPPER CARBONATE

NO	Experiment	Observation	Inference
1.	Colour of the salt	Green	May be Copper salt
2.	**Action of heat :** Little of the salt is heated in a dry test tube	No characteristic change	Absence of Nitrate, Ammonium and Zinc
3.	**Flame test :** Little of the salt is made into a paste with conc. HCl in a watch glass and it is burnt by the non luminous part of the Bunsen flame using a glass rod	Bluish green flame	Presence of copper
4.	**Action of dil.HCl:** Salt + dil.HCl and heated.	Colourless, Odourless gas with brisk effervescence turning lime water milky	Presence of Carbonate confirmed
5.	**Action of Conc.H_2SO_4:** Salt +Conc. H_2SO_4 +heated.	No characteristic change.	Absence of Chloride, Bromide & Nitrate
6.	**Action of MnO_2 and Conc. H_2SO_4:** Salt + MnO_2 + Conc. H_2SO_4 and heated.	No characteristic change.	Absence of Chloride, Bromide
7.	**Action of Conc.H_2SO_4Copper turning test:** Salt + Copper turnings + conc. H_2SO_4 and heated.	No Reddish brown gas	Absence of Nitrate
8.	**Action of dil. NaOH:** Salt + dil. NaOH and heated	No Pungent smelling gas	Absence of Ammonium salt
9.	**Chromyl chloride test:** Salt + $K_2Cr_2O_7$ + Conc.H_2SO_4 and heated.	No red orange vapours evolved	Absence of Chloride

Preparation of Sodium Carbonate extract :

Salt +Na_2CO_3 + distilled water, Boiled, Cooled and filtered. The clear filtrate is called sodium carbonate extract.

10	**Test for halides:** Extract + dil. HNO_3 + $AgNO_3$	No characteristic precipitate	Absence of Chloride, Bromide and Sulphide
11	**$BaCl_2$ test:**Extract + dil. HCl +$BaCl_2$	White precipitate insoluble in dil.H_2SO_4	Presence of Sulphate
12	**Lead acetate test:** Extract + CH_3COOH +Lead acetate	White precipitate soluble in ammonium acetate.	Presence of Sulphate
13	**Brown Ring test:** Extract + dil.H_2SO_4 + freshly prepared $FeSO_4$ and conc. H_2SO_4 is added along the sides of the test tube .	No Brown ring is formed	Absence of Nitrate
14	**Ammonium molybdate test:** Extract + dil HNO_3 + ammonium molybdate and Conc. HNO_3	No canary yellow precipitate	Absence of phosphate
15	**Test with sodium nitro bruside:** Extract + dil .ammonia + sodium nitro bruside.	No purple or violet colouration appears	Absence of sulphide.
	Analysis of Basic Radicals		
	Preparation of Original Solution: Salt + dil. HNO_3 gives original solution.		
1.	**Analysis Of Ammonium:** Original Solution + NaOH + Nessler's reagent	No chocolate brown precipitate	Absence of Ammonium (Group zero)
	Group Separation		
1.	Original Solution + dil. HCl	No White precipitate	Absence of I group Lead
2.	Original Solution + dil. HCl+ H_2S gas is passed	Black precipitate	Presence of II group Copper
	Confirmatory Test - Copper		
	Copper (Group II) Original solution + Acetic acid + potassium ferrocyanide	Red brown precipitate	Copper is confirmed

Result: The given simple salt contains

i) Acid radical **Carbonate**

ii) Basic radical **Copper**

iii) The given simple salt is **Copper carbonate**

4. FERRIC CHLORIDE

NO	Experiment	Observation	Inference
1.	Colour of the salt	Brown	May be an Iron(Ferric) salt
2.	**Action of heat :** Little of the salt is heated in a dry test tube	No characteristic change	Absence of Nitrate, Ammonium and Zinc
3.	**Flame test :** Little of the salt is made into a paste with conc. HCl in a watch glass and it is burnt by the non luminous part of the Bunsen flame using a glass rod	No characteristic flame	Absence of Copper, Calcium and Barium
4.	**Action of dil.HCl:** Salt + dil.HCl and heated.	No characteristic change	Absence of Nitrate, Carbonate & Sulphide
5.	**Action of Conc.H_2SO_4:** Salt +Conc. H_2SO_4 +heated.	A colourless gas evolves. It gives a dense white fumes when a glass rod dipped in liquid ammonia is brought close to its mouth.	Presence of chloride
6.	**Action of MnO_2 and Conc. H_2SO_4:** Salt + MnO_2 + Conc. H_2SO_4 and heated.	A greenish yellow gas turning starch iodide paper blue evolves.	Presence of chloride
7.	**Action of Conc.H_2SO_4Copper turning test:** Salt + Copper turnings + conc. H_2SO_4 and heated.	No Reddish brown gas	Absence of Nitrate
8.	**Action of dil. NaOH:** Salt + dil. NaOH and heated	No Pungent smelling gas	Absence of Ammonium salt
9.	**Chromyl chloride test:** Salt + $K_2Cr_2O_7$ + Conc.H_2SO_4 and heated.	**Red orange vapours evolved** is passed through NaOH in a test tube. Yellow solution is obtained. On adding dil acetic acid and Lead acetate solution, yellow precipitate is formed.	Presence of Chloride confirmed

Preparation of Sodium Carbonate extract :

Salt +Na_2CO_3 + distilled water, Boiled, Cooled and filtered. The clear filtrate is called sodium carbonate extract.

10	**Test for halides:** Extract + dil. HNO_3 + $AgNO_3$	Curdy white precipitate	Presence of Chloride
11	**$BaCl_2$ test:** Extract + dil. HCl +$BaCl_2$	No White precipitate	Absence of Sulphate
12	**Lead acetate test:** Extract + CH_3COOH +Lead acetate	No White precipitate	Absence of Sulphate
13	**Brown Ring test:** Extract + dil.H_2SO_4 + freshly prepared $FeSO_4$ and conc. H_2SO_4 is added along the sides of the test tube .	No Brown ring is formed	Absence of Nitrate
14	**Ammonium molybdate test:** Extract + dil HNO_3 + ammonium molybdate and Conc. HNO_3	No canary yellow precipitate	Absence of phosphate
15	**Test with sodium nitro bruside:** Extract + dil .ammonia + sodium nitro bruside.	No purple or violet colouration appears	Absence of sulphide.
	Analysis of Basic Radicals		
	Preparation of Original Solution: Salt + water gives original solution.		
1.	**Analysis Of Ammonium:** Original Solution + NaOH + Nessler's reagent	No chocolate brown precipitate	Absence of Ammonium (Group zero)
	Group Separation		
1.	Original Solution + dil. HCl	No White precipitate	Absence of I group Lead
2.	Original Solution + dil. HCl+ H_2S gas is passed	No Black precipitate	Absence of II group Copper
3.	Original Solution + NH_4Cl + NH_4OH	White precipitate	Presence of III group Aluminium or Ferric iron.
	Confirmatory Test – Ferric		
	Ferric Iron (Group III) Original solution + sodium peroxide + dil HCl + potassium ferro cyanide	Blue precipitate	Ferric iron is confirmed

Result: The given simple salt contains

i) Acid radical **Chloride**

ii) Basic radical **Ferric**

iii) The given simple salt is **Ferric chloride**

5. ZINC SULPHATE

NO	Experiment	Observation	Inference
1.	Colour of the salt	Colourless	Absence of Copper and Iron Salts
2.	**Action of heat :** Little of the salt is heated in a dry test tube	Yellow when hot, white when cooled.	May be Zinc
3.	**Flame test :** Little of the salt is made into a paste with conc. HCl in a watch glass and it is burnt by the non luminous part of the Bunsen flame using a glass rod	No characteristic flame	Absence of Copper, Calcium and Barium
4.	**Action of dil.HCl:** Salt + dil.HCl and heated.	No characteristic change	Absence of Nitrate, Carbonate & Sulphide
5.	**Action of Conc.H_2SO_4:** Salt +Conc. H_2SO_4 +heated.	No characteristic change.	Absence of Chloride, Bromide & Nitrate
6.	**Action of MnO_2 and Conc. H_2SO_4:** Salt + MnO_2 + Conc. H_2SO_4 and heated.	No characteristic change.	Absence of Chloride, Bromide
7.	**Action of Conc.H_2SO_4Copper turning test:** Salt + Copper turnings + conc. H_2SO_4 and heated.	No Reddish brown gas	Absence of Nitrate
8.	**Action of dil. NaOH:** Salt + dil. NaOH and heated	No Pungent smelling gas	Absence of Ammonium salt
9.	**Chromyl chloride test:** Salt + $K_2Cr_2O_7$ + Conc.H_2SO_4 and heated.	No red orange vapours evolved	Absence of Chloride

Preparation of Sodium Carbonate extract :

Salt +Na_2CO_3 + distilled water, Boiled, Cooled and filtered. The clear filtrate is called sodium carbonate extract.

10	**Test for halides:** Extract + dil. HNO_3 + $AgNO_3$	No characteristic precipitate	Absence of Chloride, Bromide and Sulphide
11	**$BaCl_2$ test:** Extract + dil. HCl +$BaCl_2$	White precipitate insoluble in dil.H_2SO_4	Presence of Sulphate
12	**Lead acetate test:** Extract + CH_3COOH +Lead acetate	White precipitate soluble in ammonium acetate.	Presence of Sulphate
13	**Brown Ring test:** Extract + dil.H_2SO_4 + freshly prepared $FeSO_4$ and conc. H_2SO_4 is added along the sides of the test tube .	No Brown ring is formed	Absence of Nitrate
14	**Ammonium molybdate test:** Extract + dil HNO_3 + ammonium molybdate and Conc. HNO_3	No canary yellow precipitate	Absence of phosphate
15	**Test with sodium nitro bruside:** Extract + dil .ammonia + sodium nitro bruside.	No purple or violet colouration appears	Absence of sulphide.

Analysis of Basic Radicals

Preparation of Original Solution:

Salt + water gives original solution.

1.	**Analysis Of Ammonium:** Original Solution + NaOH + Nessler's reagent	No chocolate brown precipitate	Absence of Ammonium (Group zero)
	Group Separation		
1.	Original Solution + dil. HCl	No White precipitate	Absence of I group Lead
2.	Original Solution + dil. HCl+ H_2S gas is passed	No Black precipitate	Absence of II group Copper
3.	Original Solution + NH_4Cl + NH_4OH	No White precipitate	Absence of III group Aluminium or Ferric iron.
4.	Original Solution + NH_4Cl + NH_4OH + H_2S gas is passed	Dirty white precipitate	Presence of IV group Zinc
	Confirmatory Test - Zinc		
	Zinc (Group IV) Original solution + potassium ferro cyanide	White precipitate	Zinc is confirmed

Result: The given simple salt contains

i) Acid radical **Sulphate**

ii) Basic radical **Zinc**

iii) The given simple salt is **Zinc sulphate**

5. ZINC SULPHIDE

NO	Experiment	Observation	Inference
1.	Colour of the salt	Colourless	Absence of Copper and Iron Salts
2.	**Action of heat :** Little of the salt is heated in a dry test tube	Yellow when hot, white when cooled.	May be Zinc
3.	**Flame test :** Little of the salt is made into a paste with conc. HCl in a watch glass and it is burnt by the non luminous part of the Bunsen flame using a glass rod	No characteristic flame	Absence of Copper, Calcium and Barium
4.	**Action of dil.HCl:** Salt + dil.HCl and heated.	Rotten egg smelling gas turning lead acetate paper black.	Presence of Sulphide confirmed
5.	**Action of Conc.H_2SO_4:** Salt +Conc. H_2SO_4 +heated.	No characteristic change.	Absence of Chloride, Bromide & Nitrate
6.	**Action of MnO_2 and Conc. H_2SO_4:** Salt + MnO_2 + Conc. H_2SO_4 and heated.	No characteristic change.	Absence of Chloride, Bromide
7.	**Action of Conc.H_2SO_4Copper turning test:** Salt + Copper turnings + conc. H_2SO_4 and heated.	No Reddish brown gas	Absence of Nitrate
8.	**Action of dil. NaOH:** Salt + dil. NaOH and heated	No Pungent smelling gas	Absence of Ammonium salt
9.	**Chromyl chloride test:** Salt + $K_2Cr_2O_7$ + Conc.H_2SO_4 and heated.	No red orange vapours evolved	Absence of Chloride

Preparation of Sodium Carbonate extract :

Salt +Na_2CO_3 + distilled water, Boiled, Cooled and filtered. The clear filtrate is called sodium carbonate extract.

10	**Test for halides:** Extract + dil. HNO_3 + $AgNO_3$	Black precipitate	Presence of Sulphide
11	**$BaCl_2$ test:**Extract + dil. HCl +$BaCl_2$	No white precipitate	Absence of Sulphate
12	**Lead acetate test:** Extract + CH_3COOH +Lead acetate	No White precipitate	Absence of Sulphate
13	**Brown Ring test:** Extract + dil.H_2SO_4 + freshly prepared $FeSO_4$ and conc. H_2SO_4 is added along the sides of the test tube .	No Brown ring is formed	Absence of Nitrate
14	**Ammonium molybdate test:** Extract + dil HNO_3 + ammonium molybdate and Conc. HNO_3	No canary yellow precipitate	Absence of phosphate
15	**Test with sodium nitro bruside:** Extract + dil .ammonia + sodium nitro bruside.	purple or violet colouration appears	presence of sulphide.

Analysis of Basic Radicals

Preparation of Original Solution:

Salt + dil HNO_3 gives original solution.

1.	**Analysis Of Ammonium:** Original Solution + NaOH + Nessler's reagent	No chocolate brown precipitate	Absence of Ammonium (Group zero)
	Group Separation		
1.	Original Solution + dil. HCl	No White precipitate	Absence of I group Lead
2.	Original Solution + dil. HCl+ H_2S gas is passed	No Black precipitate	Absence of II group Copper
3.	Original Solution + NH_4Cl + NH_4OH	No White precipitate	Absence of III group Aluminium or Ferric iron.
4.	Original Solution + NH_4Cl + NH_4OH + H_2S gas is passed	Dirty white precipitate	Presence of IV group Zinc
	Confirmatory Test - Zinc		
	Zinc (Group IV) Original solution + potassium ferro cyanide	White precipitate	Zinc is confirmed

Result: The given simple salt contains

i) Acid radical **Sulphide**

ii) Basic radical **Zinc**

iii) The given simple salt is **Zinc sulphide**

7. ALUMINIUM SULPHATE

NO	Experiment	Observation	Inference
1.	Colour of the salt	Colourless	Absence of Copper and Iron Salts
2.	**Action of heat :** Little of the salt is heated in a dry test tube	No characteristic change	Absence of Nitrate, Ammonium and Zinc
3.	**Flame test :** Little of the salt is made into a paste with conc. HCl in a watch glass and it is burnt by the non luminous part of the Bunsen flame using a glass rod	No characteristic flame	Absence of Copper, Calcium and Barium
4.	**Action of dil.HCl:** Salt + dil.HCl and heated.	No characteristic change	Absence of Nitrate, Carbonate & Sulphide
5.	**Action of Conc.H_2SO_4:** Salt +Conc. H_2SO_4 +heated.	No characteristic change.	Absence of Chloride, Bromide & Nitrate
6.	**Action of MnO_2 and Conc. H_2SO_4:** Salt + MnO_2 + Conc. H_2SO_4 and heated.	No characteristic change.	Absence of Chloride, Bromide
7.	**Action of Conc.H_2SO_4Copper turning test:** Salt + Copper turnings + conc. H_2SO_4 and heated.	No Reddish brown gas	Absence of Nitrate
8.	**Action of dil. NaOH:** Salt + dil. NaOH and heated	No Pungent smelling gas	Absence of Ammonium salt
9.	**Chromyl chloride test:** Salt + $K_2Cr_2O_7$ + Conc.H_2SO_4 and heated.	No red orange vapours evolved	Absence of Chloride

Preparation of Sodium Carbonate extract :

Salt +Na_2CO_3 + distilled water, Boiled, Cooled and filtered. The clear filtrate is called sodium carbonate extract.

10	**Test for halides:** Extract + dil. HNO_3 + $AgNO_3$	No characteristic precipitate	Absence of Chloride, Bromide and Sulphide
11	**$BaCl_2$ test:** Extract + dil. HCl +$BaCl_2$	White precipitate insoluble in dil.H_2SO_4	Presence of Sulphate
12	**Lead acetate test:** Extract + CH_3COOH +Lead acetate	White precipitate soluble in ammonium acetate.	Presence of Sulphate
13	**Brown Ring test:** Extract + dil.H_2SO_4 + freshly prepared $FeSO_4$ and conc. H_2SO_4 is added along the sides of the test tube .	No Brown ring is formed	Absence of Nitrate
14	**Ammonium molybdate test:** Extract + dil HNO_3 + ammonium molybdate and Conc. HNO_3	No canary yellow precipitate	Absence of phosphate
15	**Test with sodium nitro bruside:** Extract + dil .ammonia + sodium nitro bruside.	No purple or violet colouration appears	Absence of sulphide.

Analysis of Basic Radicals

Preparation of Original Solution:

Salt + water gives original solution.

1.	**Analysis Of Ammonium:** Original Solution + NaOH + Nessler's reagent	No chocolate brown precipitate	Absence of Ammonium (Group zero)
	Group Separation		
1.	Original Solution + dil. HCl	No White precipitate	Absence of I group Lead
2.	Original Solution + dil. HCl+ H_2S gas is passed	No Black precipitate	Absence of II group Copper
3.	Original Solution + NH_4Cl + NH_4OH	White precipitate	Presence of III group Aluminium or Ferric iron.
	Confirmatory Test - Aluminium		
	Aluminium (Group III) Original solution + sodium peroxide + dil HCl	Gelatinous white ppt	Aluminium is confirmed

Result: The given simple salt contains

i) Acid radical **Sulphate**

ii) Basic radical **Aluminium**

iii) The given simple salt is **Aluminium sulphate**

8. ALUMINIUM NITRATE

NO	Experiment	Observation	Inference
1.	Colour of the salt	Colourless	Absence of Copper and Iron Salts
2.	**Action of heat :** Little of the salt is heated in a dry test tube	Reddish brown gas	May be Nitrate
3.	**Flame test :** Little of the salt is made into a paste with conc. HCl in a watch glass and it is burnt by the non luminous part of the Bunsen flame using a glass rod	No characteristic flame	Absence of Copper, Calcium and Barium
4.	**Action of dil.HCl:** Salt + dil.HCl and heated.	Reddish brown gas with the fishy odour turning a moist ferrous sulphate paper brown	Presence of Nitrate
5.	**Action of Conc.H_2SO_4:** Salt +Conc. H_2SO_4 +heated.	Reddish brown gas turning acidified ferrous sulphate paper green evolves.	Presence of nitrate
6.	**Action of MnO_2 and Conc. H_2SO_4:** Salt + MnO_2 + Conc. H_2SO_4 and heated.	No characteristic change.	Absence of Chloride, Bromide
7.	**Action of Conc.H_2SO_4Copper turning test:** Salt + Copper turnings + conc. H_2SO_4 and heated.	Reddish brown gas	Presence of Nitrate
8.	**Action of dil. NaOH:** Salt + dil. NaOH and heated	No Pungent smelling gas	Absence of Ammonium salt
9.	**Chromyl chloride test:** Salt + $K_2Cr_2O_7$ + Conc.H_2SO_4 and heated.	No red orange vapours evolved	Absence of Chloride

Preparation of Sodium Carbonate extract :

Salt +Na_2CO_3 + distilled water, Boiled, Cooled and filtered. The clear filtrate is called sodium carbonate extract.

10	**Test for halides:** Extract + dil. HNO_3 + $AgNO_3$	No characteristic precipitate	Absence of Chloride, Bromide and Sulphide
11	**$BaCl_2$ test:**Extract + dil. HCl +$BaCl_2$	No white precipitate	Absence of Sulphate
12	**Lead acetate test:** Extract + CH_3COOH +Lead acetate	No White precipitate	Absence of Sulphate
13	**Brown Ring test:** Extract + dil.H_2SO_4 + freshly prepared $FeSO_4$ and conc. H_2SO_4 is added along the sides of the test tube .	Brown ring is formed	Presence of Nitrate
14	**Ammonium molybdate test:** Extract + dil HNO_3 + ammonium molybdate and Conc. HNO_3	No canary yellow precipitate	Absence of phosphate
15	**Test with sodium nitro bruside:** Extract + dil .ammonia + sodium nitro bruside.	No purple or violet colouration appears	Absence of sulphide.

Analysis of Basic Radicals

Preparation of Original Solution:

Salt + water gives original solution.

1.	**Analysis Of Ammonium:** Original Solution + NaOH + Nessler's reagent	No chocolate brown precipitate	Absence of Ammonium (Group zero)
	Group Separation		
1.	Original Solution + dil. HCl	No White precipitate	Absence of I group Lead
2.	Original Solution + dil. HCl+ H_2S gas is passed	No Black precipitate	Absence of II group Copper
3.	Original Solution + NH_4Cl + NH_4OH	White precipitate	Presence of III group Aluminium or Ferric iron
	Confirmatory Test - Aluminium		
	Aluminium (Group III) Original solution + sodium peroxide + dil HCl	Gelatinous white precipiate	Aluminium is confirmed

Result: The given simple salt contains

i) Acid radical **Nitrate**

ii) Basic radical **Aluminium**

iii) The given simple salt is **Aluminium nitrate**

9. CALCIUM CARBONATE

NO	Experiment	Observation	Inference
1.	Colour of the salt	Colourless	Absence of Copper and Iron Salts
2.	**Action of heat :** Little of the salt is heated in a dry test tube	No characteristic change	Absence of Nitrate, Ammonium and Zinc
3.	**Flame test :** Little of the salt is made into a paste with conc. HCl in a watch glass and it is burnt by the non luminous part of the Bunsen flame using a glass rod	Brick red flame	Presence of Calcium
4.	**Action of dil.HCl:** Salt + dil.HCl and heated.	Colourless, Odourless gas with brisk effervescence turning lime water milky	Presence of Carbonate confirmed
5.	**Action of Conc.H_2SO_4:** Salt +Conc. H_2SO_4 +heated.	No characteristic change.	Absence of Chloride, Bromide & Nitrate
6.	**Action of MnO_2 and Conc. H_2SO_4:** Salt + MnO_2 + Conc. H_2SO_4 and heated.	No characteristic change.	Absence of Chloride, Bromide
7.	**Action of Conc.H_2SO_4Copper turning test:** Salt + Copper turnings + conc. H_2SO_4 and heated.	No Reddish brown gas	Absence of Nitrate
8.	**Action of dil. NaOH:** Salt + dil. NaOH and heated	No Pungent smelling gas	Absence of Ammonium salt
9.	**Chromyl chloride test:** Salt + $K_2Cr_2O_7$ + Conc.H_2SO_4 and heated.	No red orange vapours evolved	Absence of Chloride

Preparation of Sodium Carbonate extract :

Salt +Na_2CO_3 + distilled water, Boiled, Cooled and filtered. The clear filtrate is called sodium carbonate extract.

10	**Test for halides:** Extract + dil. HNO_3 + $AgNO_3$	No characteristic precipitate	Absence of Chloride, Bromide and Sulphide
11	**$BaCl_2$ test:**Extract + dil. HCl +$BaCl_2$	White precipitate insoluble in dil.H_2SO_4	Presence of Sulphate
12	**Lead acetate test:** Extract + CH_3COOH +Lead acetate	White precipitate soluble in ammonium acetate.	Presence of Sulphate

13	**Brown Ring test:** Extract + dil.H_2SO_4 + freshly prepared $FeSO_4$ and conc. H_2SO_4 is added along the sides of the test tube .	No Brown ring is formed	Absence of Nitrate
14	**Ammonium molybdate test:** Extract + dil HNO_3 + ammonium molybdate and Conc. HNO_3	No canary yellow precipitate	Absence of phosphate
15	**Test with sodium nitro bruside:** Extract + dil .ammonia + sodium nitro bruside.	No purple or violet colouration appears	Absence of sulphide.
	Analysis of Basic Radicals		
	Preparation of Original Solution: Salt + dil. HNO_3 gives original solution.		
1.	**Analysis Of Ammonium:** Original Solution + NaOH + Nessler's reagent	No chocolate brown precipitate	Absence of Ammonium (Group zero)
	Group Separation		
1.	Original Solution + dil. HCl	No White precipitate	Absence of I group Lead
2.	Original Solution + dil. HCl+ H_2S gas is passed	No Black precipitate	Absence of II group Copper
3.	Original Solution + NH_4Cl + NH_4OH	No White precipitate	Absence of III group Aluminium or Ferric iron.
4.	Original Solution + NH_4Cl + NH_4OH + H_2S gas is passed	No Dirty white precipitate	Absence of IV group Zinc
5	Original Solution + NH_4Cl + NH_4OH + $(NH_4)_2CO_3$	White precipitate	Presence of V group Ba or Ca
	Confirmatory Test - Calcium		
	Calcium (Group V) Original solution + NH_4OH +Ammonium oxalate	White precipitate	Calcium is confirmed

Result: The given simple salt contains

i) Acid radical **Carbonate**

ii) Basic radical **Calcium**

iii) The given simple salt is **Calcium carbonate**

Dedication! Determination!! Distinction!!!
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10. BARIUM CHLORIDE

NO	Experiment	Observation	Inference
1.	Colour of the salt	Colourless	Absence of Copper and Iron Salts
2.	**Action of heat :** Little of the salt is heated in a dry test tube	No characteristic change	Absence of Nitrate, Ammonium and Zinc
3.	**Flame test :** Little of the salt is made into a paste with conc. HCl in a watch glass and it is burnt by the non luminous part of the Bunsen flame using a glass rod	Apple green flame	Presence of Barium
4.	**Action of dil.HCl:** Salt + dil.HCl and heated.	No characteristic change	Absence of Nitrate, Carbonate & Sulphide
5.	**Action of Conc.H_2SO_4:** Salt +Conc. H_2SO_4 +heated.	A colourless gas evolves. It gives a dense white fumes when a glass rod dipped in liquid ammonia is brought close to its mouth.	Presence of chloride
6.	**Action of MnO_2 and Conc. H_2SO_4:** Salt + MnO_2 + Conc. H_2SO_4 and heated.	A greenish yellow gas turning starch iodide paper blue evolves.	Presence of chloride
7.	**Action of Conc.H_2SO_4Copper turning test:** Salt + Copper turnings + conc. H_2SO_4 and heated.	No Reddish brown gas	Absence of Nitrate
8.	**Action of dil. NaOH:** Salt + dil. NaOH and heated	No Pungent smelling gas	Absence of Ammonium salt
9.	**Chromyl chloride test:** Salt + $K_2Cr_2O_7$ + Conc.H_2SO_4 and heated.	**Red orange vapours evolved** is passed through NaOH in a test tube. Yellow solution is obtained. On adding dil acetic acid and Lead acetate solution, yellow precipitate is formed.	Presence of Chloride confirmed

Preparation of Sodium Carbonate extract :

Salt +Na_2CO_3 + distilled water, Boiled, Cooled and filtered. The clear filtrate is called sodium carbonate extract.

10	**Test for halides:** Extract + dil. HNO_3 + $AgNO_3$	Curdy white precipitate	Presence of Chloride
11	**$BaCl_2$ test:** Extract + dil. HCl +$BaCl_2$	No White precipitate	Absence of Sulphate
12	**Lead acetate test:** Extract + CH_3COOH +Lead acetate	No White precipitate	Absence of Sulphate
13	**Brown Ring test:** Extract + dil.H_2SO_4 + freshly prepared $FeSO_4$ and conc. H_2SO_4 is added along the sides of the test tube .	No Brown ring is formed	Absence of Nitrate
14	**Ammonium molybdate test:** Extract + dil HNO_3 + ammonium molybdate and Conc. HNO_3	No canary yellow precipitate	Absence of phosphate
15	**Test with sodium nitro bruside:** Extract + dil .ammonia + sodium nitro bruside.	No purple or violet colouration appears	Absence of sulphide.

Analysis of Basic Radicals

Preparation of Original Solution: Salt + water gives original solution.

1.	**Analysis Of Ammonium:** Original Solution + NaOH + Nessler's reagent	No chocolate brown precipitate	Absence of Ammonium (Group zero)
	Group Separation		
1.	Original Solution + dil. HCl	No White precipitate	Absence of I group Lead
2.	Original Solution + dil. HCl+ H_2S gas is passed	No Black precipitate	Absence of II group Copper
3.	Original Solution + NH_4Cl + NH_4OH	No White precipitate	Absence of III group Aluminium or Ferric iron
4.	Original Solution + NH_4Cl + NH_4OH + H_2S gas is passed	No Dirty white precipitate	Absence of IV group Zinc
5.	Original Solution + NH_4Cl + NH_4OH + $(NH_4)_2CO_3$	White precipitate	Presence of V group Ba or Ca
	Confirmatory Test – Barium		
	Barium (Group V) Original solution + potassium chromate	Yellow precipitate	Barium is confirmed

Result: The given simple salt contains

i) Acid radical **Chloride**

ii) Basic radical **Barium**

iii) The given simple salt is **Barium chloride**

11. AMMONIUM CHLORIDE

NO	Experiment	Observation	Inference
1.	Colour of the salt	Colourless	Absence of Copper and Iron Salts
2.	**Action of heat :** Little of the salt is heated in a dry test tube	Pungent smelling gas giving dense white fumes with glass rod dipped in conc.HCl	May be Ammonium
3.	**Flame test :** Little of the salt is made into a paste with conc. HCl in a watch glass and it is burnt by the non luminous part of the Bunsen flame using a glass rod	No characteristic flame	Absence of Copper, Calcium and Barium
4.	**Action of dil. HCl:** Salt + dil. HCl and heated.	No characteristic change	Absence of Nitrate, Carbonate & Sulphide
5.	**Action of Conc.H_2SO_4:** Salt +Conc. H_2SO_4 +heated.	A colourless gas evolves. It gives a dense white fumes when a glass rod dipped in liquid ammonia is brought close to its mouth.	Presence of chloride
6.	**Action of MnO_2 and Conc. H_2SO_4:** Salt + MnO_2 + Conc. H_2SO_4 and heated.	A greenish yellow gas turning starch iodide paper blue evolves.	Presence of chloride
7.	**Action of Conc.H_2SO_4Copper turning test:** Salt + Copper turnings + conc. H_2SO_4 and heated.	No Reddish brown gas	Absence of Nitrate
8.	**Action of dil. NaOH:** Salt + dil. NaOH and heated	A colourless gas with the Pungent smelling gas with the smell of ammonia gives dense white fumes with rod dipped in conc.HCl.	Presence of Ammonium salt
9.	**Chromyl chloride test:** Salt + $K_2Cr_2O_7$ + Conc.H_2SO_4 and heated.	Red orange vapours evolved is passed through NaOH in a test tube. Yellow solution is obtained. On adding dil acetic acid and Lead acetate solution, yellow precipitate is formed.	Presence of Chloride confirmed

Preparation of Sodium Carbonate extract : Salt +Na_2CO_3 + distilled water, Boiled, Cooled and filtered. The clear filtrate is called sodium carbonate extract.

10	**Test for halides:** Extract + dil. HNO_3 + $AgNO_3$	Curdy white precipitate	Presence of Chloride
11	**$BaCl_2$ test:** Extract + dil. HCl +$BaCl_2$	No White precipitate	Absence of Sulphate
12	**Lead acetate test:** Extract + CH_3COOH +Lead acetate	No White precipitate	Absence of Sulphate
13	**Brown Ring test:** Extract + dil.H_2SO_4 + freshly prepared $FeSO_4$ and conc. H_2SO_4 is added along the sides of the test tube .	No Brown ring is formed	Absence of Nitrate
14	**Ammonium molybdate test:** Extract + dil HNO_3 + ammonium molybdate and Conc. HNO_3	No canary yellow precipitate	Absence of phosphate
15	**Test with sodium nitro bruside:** Extract + dil .ammonia + sodium nitro bruside.	No purple or violet colouration appears	Absence of sulphide.

Analysis of Basic Radicals

Preparation of Original Solution: Salt + water gives original solution.

1.	**Analysis Of Ammonium:** Original Solution + NaOH + Nessler's reagent	Chocolate brown precipitate	Presence of Ammonium (Group zero)

Group Separation

1.	Original Solution + dil. HCl	No White precipitate	Absence of I group Lead
2.	Original Solution + dil. HCl+ H_2S gas is passed	No Black precipitate	Absence of II group Copper
3.	Original Solution + NH_4Cl + NH_4OH	No White precipitate	Absence of III group Aluminium or Ferric iron
4.	Original Solution + NH_4Cl + NH_4OH + H_2S gas is passed	No Dirty white precipitate	Absence of IV group Zinc
5.	Original Solution + NH_4Cl + NH_4OH + $(NH_4)_2CO_3$	No White precipitate	Absence of V group Ba or Ca
6.	Original solution + NH_4Cl + NH_4OH + disodium hydrogen phosphate	No White precipitate	Absence of VI group Magnesium

Confirmatory Test – Ammonium

	Ammonium (Zero group) Original solution + NaOH + Nessler's reagent	Chocolate brown precipitate	Ammonium is confirmed

Result: The given simple salt contains

i) Acid radical **Chloride**

ii) Basic radical **Ammonium**

iii) The given simple salt is **Ammonium chloride**

11. AMMONIUM BROMIDE

NO	Experiment	Observation	Inference
1.	Colour of the salt	Colourless	Absence of Copper and Iron Salts
2.	**Action of heat :** Little of the salt is heated in a dry test tube	Pungent smelling gas giving dense white fumes with glass rod dipped in conc.HCl	May be Ammonium
3.	**Flame test :** Little of the salt is made into a paste with conc. HCl in a watch glass and it is burnt by the non luminous part of the Bunsen flame using a glass rod	No characteristic flame	Absence of Copper, Calcium and Barium
4.	**Action of dil. HCl:** Salt + dil. HCl and heated.	No characteristic change	Absence of Nitrate, Carbonate & Sulphide
5.	**Action of Conc.H_2SO_4:** Salt +Conc. H_2SO_4 +heated.	A reddish brown gas turning moist fluorescein paper green evolves.	Presence of bromide
6.	**Action of MnO_2 and Conc. H_2SO_4:** Salt + MnO_2 + Conc. H_2SO_4 and heated.	A reddish brown gas turning moist fluorescein paper red evolves	Presence of Bromide
7.	**Action of Conc.H_2SO_4Copper turning test:** Salt + Copper turnings + conc. H_2SO_4 and heated.	No Reddish brown gas	Absence of Nitrate
8.	**Action of dil. NaOH:** Salt + dil. NaOH and heated	A colourless gas with the Pungent smelling gas with the smell of ammonia gives dense white fumes with rod dipped in conc.HCl.	Presence of Ammonium salt
9.	**Chromyl chloride test:** Salt + $K_2Cr_2O_7$ + Conc.H_2SO_4 and heated.	No red orange vapours evolved	Absence of Chloride

Preparation of Sodium Carbonate extract : Salt +Na_2CO_3 + distilled water, Boiled, Cooled and filtered. The clear filtrate is called sodium carbonate extract.

10	**Test for halides:** Extract + dil. HNO_3 + $AgNO_3$	A pale yellow ppt	Presence of Bromide
11	**$BaCl_2$ test:** Extract + dil. HCl +$BaCl_2$	No White precipitate	Absence of Sulphate
12	**Lead acetate test:** Extract + CH_3COOH +Lead acetate	No White precipitate	Absence of Sulphate
13	**Brown Ring test:** Extract + dil.H_2SO_4 + freshly prepared $FeSO_4$ and conc. H_2SO_4 is added along the sides of the test tube .	No Brown ring is formed	Absence of Nitrate
14	**Ammonium molybdate test:** Extract + dil HNO_3 + ammonium molybdate and Conc. HNO_3	No canary yellow precipitate	Absence of phosphate
15	**Test with sodium nitro bruside:** Extract + dil .ammonia + sodium nitro bruside.	No purple or violet colouration appears	Absence of sulphide.

Analysis of Basic Radicals

Preparation of Original Solution: Salt + water gives original solution.

1.	**Analysis Of Ammonium:** Original Solution + NaOH + Nessler's reagent	Chocolate brown precipitate	Presence of Ammonium (Group zero)
	Group Separation		
1.	Original Solution + dil. HCl	No White precipitate	Absence of I group Lead
2.	Original Solution + dil. HCl+ H_2S gas is passed	No Black precipitate	Absence of II group Copper
3.	Original Solution + NH_4Cl + NH_4OH	No White precipitate	Absence of III group Aluminium or Ferric iron
4.	Original Solution + NH_4Cl + NH_4OH + H_2S gas is passed	No Dirty white precipitate	Absence of IV group Zinc
5.	Original Solution + NH_4Cl + NH_4OH + $(NH_4)_2CO_3$	No White precipitate	Absence of V group Ba or Ca
6.	Original solution + NH_4Cl + NH_4OH + disodium hydrogen phosphate	No White precipitate	Absence of VI group Magnesium
	Confirmatory Test – Ammonium		
	Ammonium (Zero group) Original solution + NaOH + Nessler's reagent	Chocolate brown precipitate	Ammonium is confirmed

Result: The given simple salt contains

i) Acid radical **Bromide**

ii) Basic radical **Ammonium**

iii) The given simple salt is **Ammonium bromide**

13. MAGESIUM SULPHATE

NO	Experiment	Observation	Inference
1.	Colour of the salt	Colourless	Absence of Copper and Iron Salts
2.	**Action of heat :** Little of the salt is heated in a dry test tube	No characteristic change	Absence of Nitrate, Ammonium and Zinc
3.	**Flame test :** Little of the salt is made into a paste with conc. HCl in a watch glass and it is burnt by the non luminous part of the Bunsen flame using a glass rod	No characteristic flame	Absence of Copper, Calcium and Barium
4.	**Action of dil.HCl:** Salt + dil.HCl and heated.	No characteristic change	Absence of Nitrate, Carbonate & Sulphide
5.	**Action of Conc.H_2SO_4:** Salt +Conc. H_2SO_4 +heated.	No characteristic change.	Absence of Chloride, Bromide & Nitrate
6.	**Action of MnO_2 and Conc. H_2SO_4:** Salt + MnO_2 + Conc. H_2SO_4 and heated.	No characteristic change.	Absence of Chloride, Bromide
7.	**Action of Conc.H_2SO_4Copper turning test:** Salt + Copper turnings + conc. H_2SO_4 and heated.	No Reddish brown gas	Absence of Nitrate
8.	**Action of dil. NaOH:** Salt + dil. NaOH and heated	No Pungent smelling gas	Absence of Ammonium salt
9.	**Chromyl chloride test:** Salt + $K_2Cr_2O_7$ + Conc.H_2SO_4 and heated.	No red orange vapours evolved	Absence of Chloride

Preparation of Sodium Carbonate extract :

Salt +Na_2CO_3 + distilled water, Boiled, Cooled and filtered. The clear filtrate is called sodium carbonate extract.

10	**Test for halides:** Extract + dil. HNO_3 + $AgNO_3$	No characteristic precipitate	Absence of Chloride, Bromide and Sulphide
11	**$BaCl_2$ test:**Extract + dil. HCl +$BaCl_2$	White precipitate insoluble in dil.H_2SO_4	Presence of Sulphate
12	**Lead acetate test:** Extract + CH_3COOH +Lead acetate	White precipitate soluble in ammonium acetate.	Presence of Sulphate

13	**Brown Ring test:** Extract + dil.H_2SO_4 + freshly prepared $FeSO_4$ and conc. H_2SO_4 is added along the sides of the test tube .	No Brown ring is formed	Absence of Nitrate
14	**Ammonium molybdate test:** Extract + dil HNO_3 + ammonium molybdate and Conc. HNO_3	No canary yellow precipitate	Absence of phosphate
15	**Test with sodium nitro bruside:** Extract + dil .ammonia + sodium nitro bruside.	No purple or violet colouration appears	Absence of sulphide.
	Analysis of Basic Radicals		
	Preparation of Original Solution: Salt + water gives original solution.		
1.	**Analysis Of Ammonium:** Original Solution + NaOH + Nessler's reagent	No chocolate brown precipitate	Absence of Ammonium (Group zero)
	Group Separation		
1.	Original Solution + dil. HCl	No White precipitate	Absence of I group Lead
2.	Original Solution + dil. HCl+ H_2S gas is passed	No Black precipitate	Absence of II group Copper
3.	Original Solution + NH_4Cl + NH_4OH	No White precipitate	Absence of III group Aluminium or Ferric iron.
4.	Original Solution + NH_4Cl + NH_4OH + H_2S gas is passed	No Dirty white precipitate	Absence of IV group Zinc
5.	Original Solution + NH_4Cl + NH_4OH + $(NH_4)_2CO_3$	No White precipitate	Absence of V group Ba or Ca
6.	Original solution + NH_4Cl + NH_4OH + disodium hydrogen phosphate	White precipitate	Presence of VI group Magnesium
	Confirmatory Test – Magnesium		
	Magnesium (Group VI) Original solution + NaOH + Magneson reagent	Blue precipitate	Magnesium is confirmed

Result: The given simple salt contains

i) Acid radical **Sulphate**

ii) Basic radical **Magnesium**

iii) The given simple salt is **Magnesium sulphate**

14. MAGNESIUM CARBONATE

NO	Experiment	Observation	Inference
1.	Colour of the salt	Colourless	Absence of Copper and Iron Salts
2.	**Action of heat :** Little of the salt is heated in a dry test tube	No characteristic change	Absence of Nitrate, Ammonium and Zinc
3.	**Flame test :** Little of the salt is made into a paste with conc. HCl in a watch glass and it is burnt by the non luminous part of the Bunsen flame using a glass rod	No characteristic flame	Absence of Copper, Calcium and Barium
4.	**Action of dil.HCl:** Salt + dil.HCl and heated.	Colourless, Odourless gas with brisk effervescence turning lime water milky	Presence of Carbonate confirmed
5.	**Action of Conc.H_2SO_4:** Salt +Conc. H_2SO_4 +heated.	No characteristic change.	Absence of Chloride, Bromide & Nitrate
6.	**Action of MnO_2 and Conc. H_2SO_4:** Salt + MnO_2 + Conc. H_2SO_4 and heated.	No characteristic change.	Absence of Chloride, Bromide
7.	**Action of Conc.H_2SO_4Copper turning test:** Salt + Copper turnings + conc. H_2SO_4 and heated.	No Reddish brown gas	Absence of Nitrate
8.	**Action of dil. NaOH:** Salt + dil. NaOH and heated	No Pungent smelling gas	Absence of Ammonium salt
9.	**Chromyl chloride test:** Salt + $K_2Cr_2O_7$ + Conc.H_2SO_4 and heated.	No red orange vapours evolved	Absence of Chloride

Preparation of Sodium Carbonate extract :

Salt +Na_2CO_3 + distilled water, Boiled, Cooled and filtered. The clear filtrate is called sodium carbonate extract.

10	**Test for halides:** Extract + dil. HNO_3 + $AgNO_3$	No characteristic precipitate	Absence of Chloride, Bromide and Sulphide
11	**$BaCl_2$ test:**Extract + dil. HCl +$BaCl_2$	White precipitate insoluble in dil.H_2SO_4	Presence of Sulphate
12	**Lead acetate test:** Extract + CH_3COOH +Lead acetate	White precipitate soluble in ammonium acetate.	Presence of Sulphate

13	**Brown Ring test:** Extract + dil.H_2SO_4 + freshly prepared $FeSO_4$ and conc. H_2SO_4 is added along the sides of the test tube .	No Brown ring is formed	Absence of Nitrate
14	**Ammonium molybdate test:** Extract + dil HNO_3 + ammonium molybdate and Conc. HNO_3	No canary yellow precipitate	Absence of phosphate
15	**Test with sodium nitro bruside:** Extract + dil .ammonia + sodium nitro bruside.	No purple or violet colouration appears	Absence of sulphide.
	Analysis of Basic Radicals		
	Preparation of Original Solution: Salt + dil. HNO_3 gives original solution.		
1.	**Analysis Of Ammonium:** Original Solution + NaOH + Nessler's reagent	No chocolate brown precipitate	Absence of Ammonium (Group zero)
	Group Separation		
1.	Original Solution + dil. HCl	No White precipitate	Absence of I group Lead
2.	Original Solution + dil. HCl+ H_2S gas is passed	No Black precipitate	Absence of II group Copper
3.	Original Solution + NH_4Cl + NH_4OH	No White precipitate	Absence of III group Aluminium or Ferric iron.
4.	Original Solution + NH_4Cl + NH_4OH + H_2S gas is passed	No Dirty white precipitate	Absence of IV group Zinc
5	Original Solution + NH_4Cl + NH_4OH + $(NH_4)_2CO_3$	No White precipitate	Absence of V group Ba or Ca
6.	Original solution + NH_4Cl + NH_4OH + disodium hydrogen phosphate	White precipitate	Presence of VI group Magnesium
	Confirmatory Test - Calcium		
	Magnesium (Group VI) Original solution + NaOH+Magneson reagent	Blue precipitate	Magnesium is confirmed

Result: The given simple salt contains

i) Acid radical **Carbonate**

ii) Basic radical **Magnesium**

iii) The given simple salt is **Magnesium carbonate**

15. MAGESIUM PHOSPHATE

NO	Experiment	Observation	Inference
1.	Colour of the salt	Colourless	Absence of Copper and Iron Salts
2.	**Action of heat :** Little of the salt is heated in a dry test tube	No characteristic change	Absence of Nitrate, Ammonium and Zinc
3.	**Flame test :** Little of the salt is made into a paste with conc. HCl in a watch glass and it is burnt by the non luminous part of the Bunsen flame using a glass rod	No characteristic flame	Absence of Copper, Calcium and Barium
4.	**Action of dil.HCl:** Salt + dil.HCl and heated.	No characteristic change	Absence of Nitrate, Carbonate & Sulphide
5.	**Action of Conc.H_2SO_4:** Salt +Conc. H_2SO_4 +heated.	No characteristic change.	Absence of Chloride, Bromide & Nitrate
6.	**Action of MnO_2 and Conc. H_2SO_4:** Salt + MnO_2 + Conc. H_2SO_4 and heated.	No characteristic change.	Absence of Chloride, Bromide
7.	**Action of Conc.H_2SO_4Copper turning test:** Salt + Copper turnings + conc. H_2SO_4 and heated.	No Reddish brown gas	Absence of Nitrate
8.	**Action of dil. NaOH:** Salt + dil. NaOH and heated	No Pungent smelling gas	Absence of Ammonium salt
9.	**Chromyl chloride test:** Salt + $K_2Cr_2O_7$ + Conc.H_2SO_4 and heated.	No red orange vapours evolved	Absence of Chloride

Preparation of Sodium Carbonate extract :

Salt +Na_2CO_3 + distilled water, Boiled, Cooled and filtered. The clear filtrate is called sodium carbonate extract.

10	**Test for halides:** Extract + dil. HNO_3 + $AgNO_3$	No characteristic precipitate	Absence of Chloride, Bromide and Sulphide
11	**$BaCl_2$ test:**Extract + dil. HCl +$BaCl_2$	No White precipitate	Absence of Sulphate
12	**Lead acetate test:** Extract + CH_3COOH +Lead acetate	No White precipitate	Absence of Sulphate
13	**Brown Ring test:** Extract + dil.H_2SO_4 + freshly prepared $FeSO_4$ and conc. H_2SO_4 is added along the sides of the test tube .	No Brown ring is formed	Absence of Nitrate

14	**Ammonium molybdate test:** Extract + dil HNO_3 + ammonium molybdate and Conc. HNO_3	A canary yellow ppt is formed.	Presence of phosphate
15	**Test with sodium nitro bruside:** Extract + dil .ammonia + sodium nitro bruside.	No purple or violet colouration appears	Absence of sulphide.

Analysis of Basic Radicals

Preparation of Original Solution:

Salt + water gives original solution.

1.	**Analysis Of Ammonium:** Original Solution + NaOH + Nessler's reagent	No chocolate brown precipitate	Absence of Ammonium (Group zero)
	Group Separation		
1.	Original Solution + dil. HCl	No White precipitate	Absence of I group Lead
2.	Original Solution + dil. HCl+ H_2S gas is passed	No Black precipitate	Absence of II group Copper
3.	Original Solution + NH_4Cl + NH_4OH	No White precipitate	Absence of III group Aluminium or Ferric iron.
4.	Original Solution + NH_4Cl + NH_4OH + H_2S gas is passed	No Dirty white precipitate	Absence of IV group Zinc
5.	Original Solution + NH_4Cl + NH_4OH + $(NH_4)_2CO_3$	No White precipitate	Absence of V group Ba or Ca
6.	Original solution + NH_4Cl + NH_4OH + disodium hydrogen phosphate	White precipitate	Presence of VI group Magnesium
	Confirmatory Test – Magnesium		
	Magnesium (Group VI) Original solution + NaOH + Magneson reagent	Blue precipitate	Magnesium is confirmed

Result: The given simple salt contains

i) Acid radical **Sulphate**

ii) Basic radical **Magnesium** **iii)**The given simple salt is **Magnesium sulphate**