+1 CHEMISTRY — Systematic Analysis of Given Simple Salt

NO	Experiment	Observation	Inference
1.	**Colour:** Colour of the salt.	Blue /Green	May be Copper salts
		Brown	May be an Iron salt
		Colourless	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	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 :** Salt + Conc.HCl +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	i)Colourless, Odourless gas with brisk effervescence turning lime water milky	Presence of Carbonate confirmed
		ii)Rotten egg smelling gas	Presence of Sulphide
		iii)Reddish brown gas	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.	Presence of chloride
		Reddish brown gas.	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_4 Copper 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	Pungent smelling gas	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**	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	**$AgNO_3$ Test:** Extract + dil. HNO_3 + $AgNO_3$	i)Curdy white precipitate	Presence of Chloride
		ii)**Black precipitate**	Presence of Sulphide
		iii)A **pale yellow** precipitate	Presence of bromide
		iii)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 in drops	**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	Yellow precipitate	Presence of phosphate
		No yellow precipitate	Absence of phosphate
15	**Test with sodium nitro prusside:** Extract + dil.ammonia + sodium nitro prusside.	A **purple** or violet colouration appears	Presence of sulphide.
		No colouration	Absence of sulphide

Analysis of Basic Radicals

Preparation of Original Solution:

Salt + water 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	Brown precipitate	Presence of Ammonium (Group 0)
		No 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 (Na_2HPO_4)	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 +potassium ferrocyanide	**Red brown** precipitate	Copper is confirmed
3	**Aluminium (Group III)** Original solution+NH_4OH + Aluminon reagent	Bright **red lake ppt**	Aluminium is confirmed
	Ferric Iron (Group III) Original solution + 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+ 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 (15)

1. Lead Nitrate
2. Copper carbonate
3. Copper sulphate
4. Ferric Chloride
5. Aluminium Sulphate
6. Aluminium Nitrate
7. Zinc Sulphide
8. zinc Sulphate
9. Calcium Carbonate
10. Barium Chloride
11. Magnesium phosphate
12. Magnesium Sulphate
13. Magnesium Carbonate
14. Ammonium chloride
15. Ammonium bromide

Acid radical:	*Experiment*	*observation*	*Basic radical*
Carbonate	salt +dil HCl	Brisk effervescence	Copper, Calcium, Magnesium
Sulphide	salt + dil HCl	Rotten Egg smell	Zinc
Sulphate	salt sol+$BaCl_2$	white precipitate	Copper, Aluminium, Zn Magnesium
Nitrate	salt +Cu+ Conc.H_2SO_4	Reddish brown gas	Lead, Aluminium
Chloride	salt+$K_2Cr_2O_7$+ Conc.H_2SO_4	Red orange vapour	-Ammonium, Ferric, Barium
Phosphate	dil HNO_3 + ammonium molybdate and Conc. HNO_3	Yellow precipitate	Magnesium
Bromide	Salt + MnO_2 + Conc. H_2SO_4 and heated.	A reddish brown gas	Ammonium

Public exam Mark Distribution Details:

I. Internal assessment: 5 marks

1	Record work	3 marks
2	Skill	2 marks

II. External assessment: 15 marks

	TESTS	*MARKS*
1	*Analysis of anions (Acid radicals) 8x1/2*	*4*
2	*Sodium carbonate extract preparation*	*1*
3	*Sodium carbonate extract tests 6x1/2*	*3*
4	*Preparation of original solution*	*1*
5	*Group separation*	*3*
6	*Confirmatory test for basic radical (any one depending up on the availability of the reagent)*	*1*
7	*Report Acid radical*	*1*
	Basic radical	*1*

ALL THE BEST SCORE CENTUM MARKS

CONGRATS 2024 +2CENTUM SCORERS- SUNDARI, VENGATESH, SIVAHARI, LEKSHMI.

E.MUTHUSAMY MSc(Che)., MSc(Psy)., MEd., MPhil., MA(Eng)., MA(T)., MA(PA)., MA(Soc)., BLISc., DMLT.
B. SARANYA MUTHUSAMY BE., BEd., YouTube: ACTC Educare Whatsapp: 9940847892

ACTC CHEMISTRY TUITION CENTRE, 41/1- PWD ROAD, NAGERCOIL, 9940847892

2025-26 +2 chemistry class starts from 30-3-25 SUNDAY

E.MUTHUSAMY MSc(Che)., MSc(Psy)., MEd., MPhil., MA(Eng)., MA(T)., MA(PA)., MA(Soc)., BLISc., DMLT.

B. SARANYA MUTHUSAMY BE., BEd., YouTube: ACTC Educare Whatsapp: 9940847892