# CHEMISTRY

**INTER MEDIATE** 

# PRACTICAL MANUAL (NOT FOR SALE)



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### Inter Mediate Practical Scheme of Valuation (30 Marks) (3Hours)

I.	QUA	ALITATIVE AN	ALYSIS	10	MARKS	
	1.	Preliminary exa	aminations	$\frac{1}{2}$ x 4 = 2		
	2.	Anions		1 + 1 + 1 + 1 = 4		
	3.	Cation		2 + 1 = 3		
	4.	Correct report		1		
II.	VOL	UMETRIC AN	ALYSIS		11	MARKS
	1.	Producer in the	e first 10 Minutes. With	equation	2+	1 = 3
	2.	Tabular form	(up to 1% error)			5
		(b/w 1% to 2	2% error 4 Marks &	above 2% error 2	Marks)	
	3.	For indicating	the formula			1
	4.	For calculation	l			2
III.	Ide	ntification of fu	nctional group		04 MARK	S.
	1.	Physical state :	Solid / Liquid		½ Mark	
	2.	Ignition Test:	Sooty flame – Aron	natic	1∕2 Mark	
			Non sooty flame –	Aliphatic		
	3.	Solubility	1) In water 2) I	n NaOH	1 Mark	
			3) In HCl 4)	Conc. H <sub>2</sub> SO <sub>4</sub>		

4.	Identification test for Functional Group	5.	Confirmation tests		
	1 Mark		1 Mark		
	1. Acetic acid: Test with NaHCO <sub>3</sub> – Effervescence		Esterification Test		
	2. Ethyl alcohol: Test with $NaHCO_3 - No$ reaction		Esterification Test		
	3. Benzoic acid: Test with NaHCO <sub>3</sub> – Effervescence		Esterification Test		
	4. Acetaldehyde: Test with Schiff's reagent		Test with 2,4,DNP		
	5. Glucose : Test with Conc. $H_2SO_{4-}$		Molish Test		
	Charrinng in cold condition				
	6. Fructose: Test with Conc. H2SO4 –		Molish Test		
	Charrinng upon heat				
	7. Phenol: Test with neutral $FeCl_3$ in alcohol		Libermann Test		
	8 Aniline: Test with NaNO <sub>2</sub> , HCl and Phenol		Carbyl amine Test		
	9 Benzaldehyde: Test with Schiff's reagent		Test with 2,4,DNP		
	10 Acetone: Test with Schiff's reagent(No reaction)		Test with 2,4,DNP		
IV	V. Viva voce 02 Marks	1			
-					

V. Record 03 Marks

# 1. ESTIMATION OF NaOH

Aim:	Estimate the amount of sodium hydroxide present in 200ml of					
	the given solution. 0.1 M HCl solution is supplied.					
Apparatus:	Burette, Burette star	nd, Pipette, Con	ical flask, Beak	ers, Porcelain tile etc.		
Chemicals:	NaOH solution HCl	solution				
Indicator:	Methyl orange					
Equation:	NaOH + HCl —	→ NaCl + H	I <sub>2</sub> O			
	1Mole of NaOH =	1Mole of HC	l			
Principle:	$\mathbf{M}_{1}\mathbf{V}_{1}/\mathbf{n}_{1} = \mathbf{N}$	$M_{2}V_{2} / n_{2}$				
Procedure:	The burette (50ml)	is first rinsed w	vith tap water, t	hen with distilled water		
	and finally with the g	given HCl soluti	on. 20ml of Na	aOH solution is		
	transferred into a clean conical flask by means of pipette. 1 (or) 2 drops					
	Of methylorange ind	licator is added	to the solution.			
	The solution turns ye	ellow in colour.	The HCl soluti	on is added slowly		
	While shaking the flask. The addition is continued till the colour changes					
	from yellow to pink. It is the end point.					
	The titrations	are repeated till	two consecutiv	ve readings co - inside.		
S.No:	Volume of	Burette reading		Volume of HCl		
		T . • 4 • . 1	<b>T</b> <sup>1</sup> 1			

S.No:	Volume of	Burette reading		Volume of HCl
	NaOH	Initial	Final	Final- Initial
1	20ml			
2	20ml			
3	20ml			

 $\label{eq:2.1} {\rm Principle:} \qquad {\rm M}_1 {\rm V}_1 \, / \, {\rm n}_1 \quad = \quad {\rm M}_2 {\rm V}_2 \, / \, {\rm n}_2$ 

Equation : NaOH + HCl NaCl +  $H_2O$ 

HC1	NaOH	
Molarity $(M_1) = 0.1 M$	Molarity $(M_2) = ?$	
Volume $(V_1) = \dots$	Volume $(V_2) = 20ml$	
No.of moles $(n_1) = 1$ mole	No.of moles( $n_2$ ) = 1 mole	
Molarity $(M_2) =$	<u>M<sub>1</sub>.V<sub>1</sub>. n<sub>2</sub></u> BHAVITHA	
	V <sub>2</sub> . n <sub>1</sub> Junior College	н., у Н., у Напр
	SURYAPET	
	$= \underline{0.1 \text{ x} \dots \text{ x} 1} = \dots$	
	20 x 1	

Molarity of NaOH = .....

Weight of NaOH in 200ml solution	= <u>Molarity x Molecular weight xVol. in ml</u>
	1000
	=x 40 x 200
	1000
	= grams.
<u>Result:</u> 1. Molarity of NaOH solution	=
2. Weight of NaOH in 200ml	solution =

### 2. ESTIMATION OF HCl

	AIM:	Estimate the amount of h	ydrochloric acid p	present in 100	Oml of		
the given solution. $0.5$			M $Na_2CO_3$ solution is supplied.				
	Apparat	us: Burette, Burette stand, P	ipette ,Conical fla	sk, Beakers,	Porcelain tile etc.		
	Chemi	cals: Na <sub>2</sub> CO <sub>3</sub> solution & HC	l solution				
	Indicat	tor: Methyl orange					
	Equati	on: $Na_2CO_3 + 2HCl$ —	$\rightarrow$ 2NaCl + H <sub>2</sub> C	$\mathbf{O} + \mathbf{CO}_2$			
		1 Mole of $Na_2CO_3 =$	2 Moles of HCl				
	Princip	ple: $M_1 V_1 / n_1 = M_2$	$_{2}V_{2} / n_{2}$				
	Proced	lure: The burette(50ml) is first	st rinsed with tap v	water, then w	with distilled water		
		and finally with the given	HCl solution. 20r	nl of Na <sub>2</sub> CO	3 solution is transferred		
		into a clean conical flask by	means of pipette.	1 (or) 2 dr	ops of methyl orange		
		indicator is added to the sol	ution. The solution	on turns yello	ow in colour.		
		The HCl solution is add	ed slowly while sl	naking the fla	ask. The addition is		
		continued till the colour cha	anges from yellow	to pink. It is	the end point.		
		The titrations are repe	eated till two con	secutive read	dings co - inside.		
	1	The readings are	entered in a tabul	ar form.			
	S.No:	Volume of Na <sub>2</sub> CO <sub>3</sub>	Burette rea	ading	Volume of HCl		
			Initial	Final	Final-Initial		
	1	20ml					
	2	20ml					
	3	20ml					
		·					
Prin	nciple:	$M_1V_1 / n_1 = M_2V_2 / n_2$					
Equ	ation :	$Na_2CO_3 + 2HCl \longrightarrow 2Na$	$H_2O + H_2O + CO_2$	2			
			AFE				
	<u>Na<sub>2</sub>CC</u>	<u>D<sub>3</sub> solution</u>	<u>HCl</u>	solution			
	Molari	$(M_1) = 0.5 M$	Molarity (M	(2) = ?	,		
	Volum	$ne (V_1) = 20ml$	Volume (V	(2) = 1			
	No.of	(n) = 1 moles $(n)$	No of moles	$\frac{2}{n}$ –	2 moles		
	No.01 moles $(n_1) = 1$ mole $(n_2) = 2$ moles						
	Molari	$M_{1}$ .	V <sub>1</sub> . n <sub>2</sub>				
		-v <sub>2</sub>	• <sup>n</sup> 1				
		= 0.5  x	<u>20 x 2</u>	=			
			X 1				
	Molarity of HCl =						

Weight of HCl in 100 ml solution	= Molarity x Mole	cular weight xVol. in ml
		1000
	=	<u>x 36.5 x 100</u>
		1000
	=	grams.
<u>Result:</u>		
1. Molarity of HCl solution	=	
2. Weight of HCl in 100 ml	solution =	

### 3. ESTIMATION OF Na<sub>2</sub>CO<sub>3</sub>

AIM:	Estimate the amount of sodium carbonate present in $500$ ml of the given solution. 0.02 M H <sub>2</sub> SO <sub>4</sub> solution is supplied.
Apparatus: Chemicals:	Burette, Burette stand, Pipette ,Conical flask, Beakers, Porcelain tile etc. $Na_2CO_3$ solution $H_2SO_4$ solution
Indicator: Equation:	Methyl orange Na <sub>2</sub> CO <sub>3</sub> + $H_2SO_4$ Na <sub>2</sub> SO <sub>4</sub> + $H_2O$ + CO <sub>2</sub>
	1 Mole of $Na_2CO_3$ = 1 Mole of $H_2SO_4$
Principle:	$M_1 V_1 / n_1 = M_2 V_2 / n_2$
Procedure:	The burette(50ml) is first rinsed with tap water, then with distilled water and finally with the given $H_2SO_4$ solution. 20ml of $Na_2CO_3$ solution is transferred
	into a clean conical flask by means of pipette. 1 (or) 2 drops of methyl orange indicator is added to the solution. The solution turns yellow in colour.

The  $H_2SO_4$  solution is added slowly while shaking the flask. The addition is continued till the colour changes from yellow to pink. It is the end point. The titrations are repeated till two consecutive readings co - inside. The readings are entered in a tabular form.

S.No.	Volume of Na <sub>2</sub> CO <sub>3</sub>	Burette reading		Volume of H <sub>2</sub> SO <sub>4</sub>
		Initial	Final	Final- Initial
1	20ml			
2	20ml			
3	20ml			

Principle: Equation :

$$\underline{H_2SO_4}$$
 solution  
Molarity  $(M_1) = 0.02 M$  $\underline{Na_2CO_3 \text{ solution}}$   
Molarity  $(M_2) = ?$   
Volume  $(V_1) = \dots$   
No.of moles  $(n_1) = 1 \text{ mole}$ No.of moles  $(n_1) = 1 \text{ mole}$  $\overline{M_1.V_1.n_2}$   
 $V_2 \cdot n_1$ No.of moles  $(n_2) = 1 \text{ mole}$ Molarity  $(M_2)$  $\overline{M_1.V_1.n_2}$   
 $V_2 \cdot n_1$  $\overline{M_2CO_3 = 1 \text{ mole}}$ Molarity of Na\_2CO\_3 = .....Molarity x Molecular weight xVol. in ml  
1000 $1000$  $\underline{Molarity x Molecular weight xVol. in ml}$ 

Result:

1. Molarity of  $Na_2CO_3$  solution = .....

2. Weight of  $Na_2CO_3$  in 500 ml solution = .....

=

..... grams.

#### ESTIMATION OF H<sub>2</sub>SO<sub>4</sub> 4.

AIM:	Estimate the amount of Sulphuric acid present in 250ml of				
	the given solution . 0.3 M NaOH solution is supplied.				
Apparatus:	Burette, Burette stand, Pipette ,Conical flask, Beakers, Porcelain tile etc.				
Chemicals:	<b>NaOH</b> solution & $H_2SO_4$ solution				
Indicator:	Methyl orange				
Equation:	$H_2SO_4 + 2NaOH \longrightarrow Na_2SO_4 + 2H_2O$				
	2 Moles of NaOH = 1 Mole of $H_2SO_4$				
Principle:	$M_1 V_1 / n_1 = M_2 V_2 / n_2$				
Procedure:	The burette(50ml) is first rinsed with tap water, then with distilled water d finally with the given $H_2SO_4$ solution. 20ml of NaOH solution is transferred				

into a clean conical flask by means of pipette. 1 (or) 2 drops of methyl orange indicator is added to the solution. The solution turns yellow in colour.

The  $H_2SO_4$  solution is added slowly while shaking the flask. The addition is continued till the colour changes from yellow to pink. It is the end point. The titrations are repeated till two consecutive readings co - inside.

S.No.	Volume of NaOH	Burette reading		Volume of H <sub>2</sub> SO <sub>4</sub>
		Initial	Final	Final- Initial
1	20ml			
2	20ml			
3	20ml			

The readings are entered in a tabular form.

Principle:	$M_{1}V_{1} / n_{1}$	=	$M_2 V_2 / n_2$
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Equation : $H_2SO_4 + 2NaOH$	$\rightarrow$ Na <sub>2</sub> SO <sub>4 +</sub> 2H <sub>2</sub> O
NaOH solution	<u>H<sub>2</sub>SO<sub>4</sub> Solution</u>
Molarity $(M_1) = 0.3 M$	Molarity $(M_2) = ?$
Volume $(V_1) = 20ml$	Volume $(V_2) = \dots$
No.of moles $(n_1) = 2$ moles $(n_1)$	No.of moles( $n_2$ ) = 1 mole
Molarity $(M_2)$ = $(M_2)^{1}$	$\frac{1 \cdot V_1 \cdot n_2}{2 \cdot n_1} = \dots$
Molarity of $H_2SO_4 = \dots$	

Weight of $H_2SO_4$ in 250 ml solution	=	Molarity x Molecular weight xVol. in ml
		1000
		= <u>x 98 x 250</u>
		1000
		= grams.
Result:		
1. Molarity of <b>H</b> <sub>2</sub> <b>SO</b> <sub>4</sub>		=

2. Weight of  $H_2SO_4$  in 250 ml solution = .....

### 5. ESTIMATION OF FERROUS AMMONIUM SULPHATE

AIM:	Estimate the amount of Ferrous ammonium sulphate present in 50ml of the given solution. $0.01 \text{ M KMnO}_4$ solution is supplied.		
Apparatus: Chemicals:	Burette, Burette stand, Pipette, Conical flask, Beakers and Porcelain tile. Ferrous ammonium sulphate solution, KMnO <sub>4</sub> solution, H <sub>2</sub> SO <sub>4</sub> solution		
Indicator:	In this titration external indicator is not required. Because $KMnO_4$ acts as a self - indicator.		
Equation:	$2KMnO_4 + 10 FeSO_4 + 8 H_2SO_4 \longrightarrow K_2SO_4 + 5Fe_2(SO_4)_3 + 2MnSO_4 + 8H_2O$		
	2 Moles of <b>KMnO<sub>4</sub></b> = 10 Moles of <b>Mohr's salt</b>		
Principle:	$M_1V_1/n_1 = M_2V_2/n_2$		
Procedure:	The burette is filled with KMnO <sub>4</sub> solution. The initial reading of the burette is adjusted		
	to 'zero'(O)' the burette is clamped vertically to a burette stand.		

20ml of Ferrous ammonium sulphate solution is transferred into a clean conical flask by means of pipette.20ml of dilute sulphuric acid is added to the flask solution.

The  $KMnO_4$  solution is added slowly while shaking the flask. The titration is

continued till the solution attains permanent pale pink colour. It is the end point. The titrations are repeated till two consecutive readings co - inside. The readings are entered in a tabular form.

S.No.	Volume of	Burette reading		Volume of KMnO <sub>4</sub>
	Ferrous ammonium sulphate	Initial	Final	Final- Initial
1	20ml			
2	20ml			
3	20ml			

Principle:  $M_1V_1/n_1 = M_2V_2/n_2$ Equation :  $2 \text{ KMnO}_4 + 10 \text{ FeSO}_4 + 8 \text{ H}_2\text{SO}_4 \longrightarrow \text{ K}_2\text{SO}_4 + 5 \text{ Fe}_2(\text{SO}_4)_3 + 2 \text{ MnSO}_4 + 8 \text{ H}_2\text{O}$ 

<u>KMnO<sub>4</sub> solution</u>	<u>Mohr's sa</u>	<u>lt solution</u>
Molarity $(M_1) = 0.01 \text{ M}$	Molarity (M <sub>2</sub> )	= ?
Volume $(V_1) = \dots$	Volume $(V_2)$	= 20ml
No.of moles $(n_1) = 2$ moles	No.of moles( $n_2$ )	= 10 moles
Molarity $(M_2)$ = $M_1$ Molarity $(M_2)$ = $M_1$ $V_2$ $V_2$ $V_2$ $V_2$ $M_1$ $V_2$ $M_1$ $V_2$ $M_1$ $M_1$ $M_2$ $M_1$ $M_2$ $M_1$ $M_2$ $M_1$ $M_2$ $M_1$ $M_2$ $M_1$ $M_2$ $M_2$ $M_1$ $M_2$	$\frac{V_1 \cdot n_2}{n_1} = \frac{1}{20 \times 2}$ $\frac{V_1 \cdot n_2}{n_1} = \frac{1}{20 \times 2}$ $\frac{Molarity \times Molecular}{n_1}$	weight xVol. in ml
		1000
	=	<u>x 392 x 50</u>
		1000
<u>Result:</u>	=	grams.
1. Molarity of Mohr's salt solut	ion =	
2. Weight of Mohr's salt in 50 n	nl solution =	
	7	

	<u>6. ESTIM</u>	ATION	OF (	OXALIC ACID		
AIM: Estimate the amount of Oxalic acid present in 1000 ml of the given solution. $0.02 \text{ M KMnO}_4$ solution is supplied.						
Apparatus Chemical	Apparatus:Burette, Burette stand, Pipette, Conical flask, Beakers ,Burners and Porcelain tile.Chemicals:Oxalic acid solution, $KMnO_4$ solution, $H_2SO_4$ solution					
Indicator:	Indicator: In this titration external indicator is not required. Because $KMnO_4$ acts as a self - indicator.					
Equation:	2KMnO <sub>4</sub> +5 H <sub>2</sub> C <sub>2</sub> O <sub>4</sub> + 3 H <sub>2</sub>	<sub>2</sub> so <sub>4</sub> —	$\rightarrow K_2S$	$O_4 + 2MnSO_4 + 10 CO_2 + 8H_2O_2$		
	2 Moles of KMnO <sub>4</sub> =	= 5 Moles of	Oxalic a	cid		
Principle:	$M_1 V_1 / n_1 = M_2 V_2$	2 / n2				
Procedure	e: The burette is filled with I	KMnO <sub>4</sub> solut	tion. The	initial reading of the burette is adjusted		
20ml of Oxalic acid solution is transferred into a clean conical flask by means of pipette. 20ml of dilute sulphuric acid is added to the flask solution. The solution is then heated to short of boiling (Nearly 80°c). The KMnO <sub>4</sub> solution is added slowly while shaking the flask. The titration is continued till the solution attains permanent pale pink colour. It is the end point. The titrations are repeated till two consecutive readings co - inside.						
	continued till the solution attain The titrations are repeated ti The readings are entered in a ta	s permanent ll two consec abular form.	pale pink cutive rea	colour. It is the end point. dings co - inside.		
S.No.	continued till the solution attains The titrations are repeated ti The readings are entered in a ta Volume of Oxalic acid	s permanent ll two consec abular form. Burette r	pale pink cutive rea <b>reading</b>	colour. It is the end point. dings co - inside. <b>Volume of KMnO</b> <sub>4</sub>		
S.No.	continued till the solution attains The titrations are repeated ti The readings are entered in a ta Volume of Oxalic acid	s permanent ll two consec abular form. Burette r Initial	pale pink cutive rea <b>eading</b> Final	colour. It is the end point. dings co - inside. <b>Volume of KMnO<sub>4</sub></b> <b>Final- Initial</b>		
S.No.	continued till the solution attains The titrations are repeated ti The readings are entered in a ta Volume of Oxalic acid 20ml	s permanent ll two consec abular form. Burette r Initial	pale pink cutive rea reading Final	colour. It is the end point. dings co - inside. <b>Volume of KMnO<sub>4</sub></b> <b>Final- Initial</b>		
S.No. 1 2	continued till the solution attains The titrations are repeated ti The readings are entered in a ta Volume of Oxalic acid 20ml 20ml	s permanent ll two consec abular form. Burette r Initial	pale pink cutive rea reading Final	colour. It is the end point. dings co - inside. <b>Volume of KMnO<sub>4</sub></b> <b>Final- Initial</b>		
S.No. 1 2 3	continued till the solution attains The titrations are repeated ti The readings are entered in a ta Volume of Oxalic acid 20ml 20ml 20ml	s permanent ll two consec abular form. Burette r Initial	pale pink cutive rea reading Final	colour. It is the end point. dings co - inside. Volume of KMnO <sub>4</sub> Final- Initial		
S.No. 1 2 3 Principle:	continued till the solution attains The titrations are repeated ti The readings are entered in a ta <b>Volume of Oxalic acid</b> 20ml 20ml $M_1V_1 / n_1 = M_2V_2 / m_1$	s permanent Il two consec abular form. Burette r Initial	pale pink cutive rea reading Final	colour. It is the end point. dings co - inside. Volume of KMnO <sub>4</sub> Final- Initial		
S.No.          1         2         3         Principle:         Equation	continued till the solution attains The titrations are repeated ti The readings are entered in a ta Volume of Oxalic acid 20ml 20ml $M_1V_1/n_1 = M_2V_2/r$ : 2KMnO <sub>4</sub> +5 H <sub>2</sub> C <sub>2</sub> O <sub>4</sub> +3 H <sub>2</sub>	s permanent Il two consec abular form. Burette r Initial	pale pink cutive rea reading Final	colour. It is the end point. dings co - inside. Volume of KMnO <sub>4</sub> Final- Initial K <sub>2</sub> SO <sub>4</sub> + 2MnSO <sub>4</sub> +10 CO <sub>2</sub> +8H <sub>2</sub> O		
S.No.          1         2         3         Principle:         Equation         K	continued till the solution attains The titrations are repeated ti The readings are entered in a ta Volume of Oxalic acid 20ml 20ml 20ml $M_1V_1 / n_1 = M_2V_2 / n_1$ : 2KMnO <sub>4</sub> +5 H <sub>2</sub> C <sub>2</sub> O <sub>4</sub> +3 H <sub>2</sub> <u>MnO<sub>4</sub> solution</u>	s permanent Il two consectabular form. Burette r Initial	pale pink cutive rea reading Final	colour. It is the end point. dings co - inside. Volume of $KMnO_4$ Final- Initial $K_2SO_4 + 2MnSO_4 + 10 CO_2 + 8H_2O$ solution		
S.No.          1         2         3         Principle:         Equation         K         M	continued till the solution attains The titrations are repeated ti The readings are entered in a ta Volume of Oxalic acid 20ml 20ml 20ml 20ml $M_1V_1 / n_1 = M_2V_2 / n_1$ : 2KMnO <sub>4</sub> +5 H <sub>2</sub> C <sub>2</sub> O <sub>4</sub> +3 H <sub>2</sub> <u>MnO<sub>4</sub> solution</u> olarity (M <sub>1</sub> ) = 0.01 M	s permanent Il two consect abular form. Burette r Initial 12 2804 <u>O</u> Mc	pale pink cutive rea reading Final xalic acid plarity (M	colour. It is the end point. dings co - inside. Volume of KMnO <sub>4</sub> Final- Initial $K_2SO_4 + 2MnSO_4 + 10 CO_2 + 8H_2O$ solution $I_2$ ) = ?		
S.No.          1         2         3         Principle:         Equation         K         M         Vol	continued till the solution attains The titrations are repeated ti The readings are entered in a ta Volume of Oxalic acid 20ml 20ml 20ml 20ml $M_1V_1 / n_1 = M_2V_2 / n_1$ : 2KMnO <sub>4</sub> +5 H <sub>2</sub> C <sub>2</sub> O <sub>4</sub> +3 H <sub>2</sub> <u>MnO<sub>4</sub> solution</u> olarity (M <sub>1</sub> ) = 0.01 M olume (V <sub>1</sub> ) =	s permanent Il two consectabular form. Burette r Initial 12 2804 <u>O</u> Mc Vo	pale pink cutive rea reading Final xalic acid plarity (M lume (V	colour. It is the end point. dings co - inside. Volume of KMnO <sub>4</sub> Final- Initial $K_2SO_4 + 2MnSO_4 + 10 CO_2 + 8H_2O$ solution $I_2) = ?$ $I_2) = 20ml$		
S.No.          1         2         3         Principle:         Equation         K         M         Vol         No	continued till the solution attains The titrations are repeated ti The readings are entered in a ta Volume of Oxalic acid 20ml 20ml 20ml 20ml 20ml $M_1V_1 / n_1 = M_2V_2 / n_1$ : 2KMnO <sub>4</sub> +5 H <sub>2</sub> C <sub>2</sub> O <sub>4</sub> +3 H <sub>2</sub> <u>Solution</u> colarity (M <sub>1</sub> ) = 0.01 M colume (V <sub>1</sub> ) = p.of moles (n <sub>1</sub> ) = 2 moles	s permanent Il two consect abular form. Burette r Initial 12 2804 <u>O</u> Mo Vo	pale pink cutive rea reading Final xalic acid plarity (M lume (V p.of moles	colour. It is the end point. dings co - inside. Volume of KMnO <sub>4</sub> Final- Initial $K_2SO_4 + 2MnSO_4 + 10 CO_2 + 8H_2O$ Solution $I_2) = ?$ $I_2) = ?$ $I_2) = 20ml$ $I_3(n_2) = 5 moles$		

 $M_{1}.v_{1}.n_{2}$ V<sub>2</sub>. n<sub>1</sub>  $= \underline{0.02 \ x \dots x \ 5} = \dots$ 20 x 2

Molarity of Oxalic acid

Weight of Oxalic acid in 1000 ml solution = <u>Molarity x Molecular weight xVol. in ml</u> 1000 .....x 126 x 1000 = 1000 = ..... grams. Result: 1. Molarity of Oxalic acid solution = .....

2. Weight of Oxalic acid in 1000 ml solution = .....

= .....

### SALT ANALYSIS (10 Marks).

#### <u>I. Priliminary examinations:</u> 1) <u>Colour</u>: - Colour less / Blue / Pale green / Pink.

- 1) <u>Colour</u> 2) <u>Stata</u>a
- 2) <u>State:</u>
- 3) <u>Odour</u>:
- No odour / Pungent smell
   Water soluble

#### 4) <u>Solubility</u>: 5) Drv test:

S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry test tube and heat it	<ol> <li>White sublimation is formed</li> <li>Looses water</li> </ol>	1)May be ammonium salt 2) May be hydrated salt

- Crystalline solid / Amorphous

### **II) IDENTIFICATION OF ANION:**

S	.No	Experiment	Observation	Inference
1		Salt +dil.HCl	Buisk efforvescences are Observed	May be $CO_2^{-2}$
2		Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	() White fumes are evolved	1) May be Cl⁻
		BING	209Reddish brown fumes are evolved	2) May be Br <sup>-</sup>
3		Salt +Cu turnings + $\mathfrak{G}$ has $H_2SO_4$ and heat $\mathfrak{G}$ heat $\mathfrak{G}$ .	Reddish brown fumes are evolved	May be NO <sub>3</sub> -
4		Salt sol + $BaCl_2$ sol.	White ppt is formed It is insoluble in Conc.HCl	May be $SO_4^{-2}$

### CONFIRMATORY TEST FOR ANIONS:

U	onfirm	atory test for CO <sub>3</sub> -:		
	S.No	Experiment	Observation	Inference
	1	Salt + dil.HCl	Brisk effervesces are observed The burning splinter is puts off when it is exposed to the gas evolved & lime water turns milky.	$CO_3^{-2}$ is confirmed
	2	Salt sol + $BaCl_2$ .	White ppt is formed. It is soluble in $NH_4OH$	$CO_3^{-2}$ is confirmed.

#### Confirmatory test for Cl<sup>-</sup> ion:

S.No	Experiment	Observation	Inference			
1	Salt +MnO <sub>2</sub> powder + Conc.H <sub>2</sub> SO <sub>4</sub>	Pale green fumes are evolved	Cl <sup>-</sup> is confirmed			
2	Salt sol +AgNO3 sol	Gurdy white ppt. It is soluble in NH <sub>4</sub> OH	Cl <sup>-</sup> is confirmed			
Confir	Confirmatory test for Br ion:					

# S.No Experiment Observation Inference 1 Salt +MnO2 powder +Conc.H2SO4 Reddish brown fumes are evolved Br<sup>-</sup>is confirmed 2 Salt solution +AgNO3 sol Yellow colour ppt is formed. It is partially soluble in NH4OH Br<sup>-</sup>is confirmed

#### <u>Confirmatory test for NO<sub>3</sub> ion:</u>

S.No	Experiment	Observation	Inference
1	<b>Brown ring test:</b> 2 ml of salt solution +2ml of freshly prepared $FeSO_4$ solution and then the test tube kept in an inclined position and conc $H_2SO_4$ is added slowly along the sides of test tube.	A brown ring ([Fe.NO( $H_2O_5$ ] SO <sub>4</sub> )+ is formed at the junction of the two liquid layers.	NO <sub>3</sub> <sup>-</sup> is confirmed

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is formed	May be Pb <sup>+2</sup>
II	Salt solution +dil.HCl +H <sub>2</sub> S gas	Black ppt is formed	May be $Cu^{+2}$
Ш	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH	<ol> <li>White gelatinous ppt formed</li> <li>Dark green ppt is formed</li> </ol>	1) May be $AF^2$ 2) May be $Fe^{+2}$
IV	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH NH <sub>4</sub> OH +H <sub>2</sub> S gas	<ol> <li>White ppt is formed</li> <li>Flesh colour ppt is formed</li> </ol>	<ol> <li>May be Zn<sup>+2</sup></li> <li>May be Mn<sup>+2</sup></li> </ol>
V	Salt solution $+NH_4Cl + NH_4OH + (NH_4)_2CO_3$	White ppt is formed	May be $Ba^{+2}$ (or) $Ca^{+2}$
VI	Salt solution + NaOH solution On heating	2) Pungent smell is evolved	2) May be $NH_4^+$

# Confirmatory test for cations:Confirmatory test for $Pb^{+2}$ ion:S.NoExperimentObservation1Salt solution+ K<sub>2</sub>CrO<sub>4</sub> sol.Yellow ppt is formedPb+2is confirmed

1	Salt solution+ $K_2CrO_4$ sol.	Yellow ppt is formed It is insoluble in HNO <sub>3</sub>	Pb <sup>+2</sup> is confirmed		
Confirmatory test for Cu <sup>+2</sup> ion:					

S.No	Experiment	Observation	Inference		
1	1. Salt solution + $K_4[Fe(CN)_6]$	Chacolate Brown ppt	$Cu^{+2}$ is confirmed		
	2. Salt solution+NaOH sol	Blue Colour ppt	$Cu^{+2}$ is confirmed		
Confir	Confirmatory test for A1 <sup>+3</sup> ion.				

Comm	John matory test for Ar John					
S.No	Experiment	Observation	Inference			
1	1. Salt solution +NaOH sol	White Gelationous Ppt	$Al^{+3}$ is confirmed			
Confin	Confirmatory test for $E_{0}^{+2}$ ion.					

Confir	Confirmatory test for Fe <sup>-</sup> ion:					
	Experiment	Observation	Inference			
1	Salt solution +NaOH sol	Dark Green Ppt	$Fe^{+2}$ is confirmed			
Confir	Confirmatory test for Zn <sup>+2</sup> ion:					

S.No	Experiment	Observation	Inference
1	1. Salt solution +NaOH sol	White Belationous Ppt	$Zn^{+2}$ is confirmed
Confi	rmatory test for Mn <sup>+2</sup> ion:	بالنبا بالكراكين	

001111		
S.No	Experiment Observation	Inference
1	1. Salt solution +NaOH south and the solution +NaOH south and the solution +NaOH south and the solution and	$Mn^{+2}$ is confirmed
Confir	matory test for Ca <sup>+2</sup> / Rate ight:	
		TO

S.No	Experiment 5	Observation	Inference		
1	Salt solution $+K_2CrO_4$ sol	1.No PPT	$Ca^{+2}$ is confirmed		
Confir	Confirmatory test for Ca <sup>+2</sup> /Ba <sup>+2</sup> ion:				

Comm	omminder y test for Ca / Da Ton.				
S.No	Experiment	Observation	Inference		
1	Salt solution $+K_2CrO_4$ sol	2. Yellow ppt is formed	$Ba^{+2}$ is confirmed		

Confir	Confirmatory test for Mg <sup>+2</sup> ion:				
S.No	Experiment	Observation	Inference		
1	Salt solution + $(NH_4)_2CO_3$ solution	Slowly White ppt is formed	Mg+2 is confirmed		

Confirmatory test for NH<sub>4</sub><sup>+</sup> ion:

S.No	Experiment	Observat	tion	Inference
1	1. Salt solution +Nessler's reagent ( $K_2[HgI_4]$ )	Reddish Brown ppt. as Iodide of Millen 's	It is also Called Base	$\rm NH_4^+$ is confirmed
Result	: 1) Cation:	2) Anion:	<b>3)</b> Salt:	

# **SALT ANALYSIS -I**

### I. Priliminary examinations:

- 1) <u>Colour</u>:
- Colour less
- 2) <u>State:</u> Crystalline solid
- 3) <u>Odour</u>: No odour
- 4) <u>Solubility</u>:
- water soluble

5) Dry test:

S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry	1) Looses water	1) May be hydrated salt
	test tube and heat it		

### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not observed	CO <sub>3</sub> <sup>-2</sup> is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	<ol> <li>White fumes are not evolved</li> <li>Reddish brown fumes are not evolved</li> </ol>	<ol> <li>Cl<sup>-</sup> is absent</li> <li>Br<sup>-</sup> is absent</li> </ol>
3	Salt +Cu turnings + Conc.H $_2$ SO $_4$ and heat strongly.	Reddish brown fumes are evolved	May be NO <sub>3</sub> -

### **<u>Confirmatory test for NO<sub>3</sub>** ion:</u>

	2		
S.No	Experiment	Observation	Inference
1	<b>Brown ring test:</b> 2 ml of salt solution +2ml of freshly prepared $FeSO_4$ solution and then the test tube kept in an inclined position and conc $H_2SO_4$ is added slowly along the sides	A brown ring [Fe.NO( $H_2O$ ) <sub>5</sub> ] SO <sub>4</sub> is formed at the junction of the two liquid layers.	NO <sub>3</sub> <sup>-</sup> is confirmed
	of test tube.		

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	Pb <sup>+2</sup> is absent
Π	Salt solution +dil.HCl +H <sub>2</sub> S gas	Black ppt is not formed	Cu <sup>+2</sup> is absent
Π	Salt solution + NH <sub>4</sub> Cl + NH <sub>4</sub> OH	White gelatinous ppt formed	May be Al <sup>+3</sup>

#### <u>Confirmatory test for cations:</u> Confirmatory test for $A1^{+3}$ ion:

	S.No	Experiment	Observation	Inference
	1	1. Salt solution +NaOH sol	White Gelationous Ppt is formed	$Al^{+3}$ is confirmed
R	<u>lesult</u> :	1) Cation: $Al^{+3}$	2) Anion: NO <sub>3</sub> <sup>-</sup> 3) Sal	t: Al(NO <sub>3</sub> ) <sub>3</sub>

# **SALT ANALYSIS -II**

### I. Priliminary examinations:

- 1) <u>Colour</u>: 2) State:
- Colour less
- Crystalline solid
- 3) <u>Odour</u>: - No odour
- 4) <u>Solubility</u>:

	110 04	our
-	water	soluble

5) Dry test:

S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry test tube and heat it	1) Looses water	1) May be hydrated salt

### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not Observed	CO <sub>3</sub> <sup>-2</sup> is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	1) White fumes are not evolved	1) ci- is absent
		2) Reddish brown fumes are not evolved	
3	Salt +Cu turnings + Conc.		2) Br <sup>- is absent</sup>
5	$H_2SO_4$ and heat strongly.	Reddish brown fumes are not evolved	NO <sub>3</sub> - is absent
			May be $SO_4^{-2}$
4	Salt sol + $BaCl_2$ sol.	White ppt is formed	- <del>-</del>

Confirmatory test for  $SO_4^{-2}$  ion:

S.No	Experiment	Observation	Inference
1	Salt solution+lead acetate solution	White ppt is formed It is insoluble in Conc.HCl	$SO_4^{-2}$ is

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	Pb <sup>+2</sup> is absent
II	Salt solution +dil.HCl +H <sub>2</sub> S gas	Black ppt is not formed	$Cu^{+2}$ is absent
III	Salt solution +NH <sub>4</sub> Cl +	White gelatinous ppt formed	May be Al <sup>+3</sup>
	NH <sub>4</sub> OH		

#### **Confirmatory test for cations:** Confirmatory test for $Al^{+3}$ ion:

	<u>UIIII II</u>	latory test for Ar Ton.		
	S.No	Experiment	Observation	Inference
	1	1. Salt solution +NaOH sol	White Gelationous Ppt is formed	Al <sup>+3</sup> is confirmed
R	<u>esult</u> :	1) Cation: $Al^{+3}$	<b>2)</b> Anion: $SO_4^{-2}$ <b>3)</b> Sa	It: $Al_2(SO_4)_3$

# SALT ANALYSIS -III

### I. Priliminary examinations:

- 1) <u>Colour</u>:
- Colour less
- 2) <u>State:</u> Crystalline solid
- 3) Odour: No odour
- 4) Solubility:
- water soluble
- 5) Dry test:

S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry test tube and heat it	1) White sublimation is formed	1) May be ammonium salt

### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not observed	CO <sub>3</sub> <sup>-2</sup> is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	Reddish brown fumes are evolved	May be Br⁻

#### Confirmatory test for Br<sup>-</sup> ion:

S.No	Experiment	Observation	Inference
1	Salt +MnO <sub>2</sub> powder	Reddish brown fumes are evolved	Br is confirmed
2	+Conc.H <sub>2</sub> SO <sub>4</sub> Salt solution +AgNO <sub>3</sub> sol	Yellow colour ppt is formed. It is partially soluble in NH <sub>4</sub> OH	Br is confirmed

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	Pb <sup>+2</sup> is absent
Ш	Salt solution +dil.HCl +H <sub>2</sub> S gas Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH	Black ppt is not formed 1)White gelatinous ppt is not formed	$Cu^{+2}$ is absent 1) Al^{+3} is absent
IV	Salt solution $+NH_4Cl + NH_4OH$ NH4OH $+H_2S$ gas	<ol> <li>2) Dark green ppt is not formed</li> <li>1) White ppt is not formed</li> <li>2) Flesh colour ppt is not formed</li> </ol>	<ul> <li>2) Fe<sup>+2</sup> is absent</li> <li>1) Zn<sup>+2</sup> is absent</li> <li>2) Mn<sup>+2</sup> is absent</li> </ul>
v	Salt solution $+NH_4Cl + NH_4OH + (NH_4)_2CO_3$	White ppt is not formed	$Ba^{+2}$ (or) $Ca^{+2}$ are absent
VI	Salt solution + NaOH solution On heating	<ul><li>2) Pungent smell is evolved</li></ul>	$Mg^{+2}$ is absent May be $NH_4^+$

#### Confirmatory test for cations: Confirmatory test for NH<sub>4</sub><sup>+</sup> ion:

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S.No	Experiment	Observation	Inference
1	1. Salt solution +Nessler's reagent ( $K_2[HgI_4]$ )	Reddish Brown ppt. It is also Called as Iodide of Millen 's Base	$\rm NH_4^+$ is confirmed

<u>**Result</u>: 1) Cation: NH\_4^+</u>** 

2) Anion: Br

3) Salt: :  $NH_4Br$ 

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### **SALT ANALYSIS -IV**

### I. Priliminary examinations:

- 1) <u>Colour</u>:
- Colour less - Crystalline solid

- Pungent smell

- water soluble

- 2) <u>State:</u> 3) <u>Odour</u>:
- 4) <u>Solubility</u>:

5	) <u>Dry tes</u> t:		
S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry	1) White sublimation is formed	1) May be ammonium salt
	test tube and heat it		

### **II) IDENTIFICATION OF ANION:**

S.No	Experime	ent	Observation		Inference
1	Salt +dil.HCl		Brisk effervescences are not observ	ved	CO <sub>3</sub> <sup>-2</sup> is absent
	Confirmatory test	for CO <sub>3</sub> <sup>-2</sup> :			

S.N	o Experiment	Observation	Inference
1	Salt + dil.HCl	Brisk effervesces are observed	$CO_2^{-2}$ is confirmed
		The burning splinter is puts off when it is exposed to the gas evolved & lime water turns milky	$CO_3^{-2}$ is confirmed.
2	Salt sol + $BaCl_2$ .	White ppt is formed. It is soluble in $NH_4OH$	5

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	Pb <sup>+2</sup> is absent
п	Salt solution +dil.HCl +H <sub>2</sub> S gas	Black ppt is not formed	$Cu^{+2}$ is absent
III	Salt solution $+NH_4Cl + NH_4OH$	1)White gelatinous ppt is not formed	1) $Al^{+3}$ is absent 2) Fe <sup>+2</sup> is absent
IV	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH NH <sub>4</sub> OH +H <sub>2</sub> S gas	<ol> <li>Dark green ppt is not formed</li> <li>White ppt is not formed</li> <li>Flesh colour ppt is not formed</li> </ol>	<ol> <li>1) Zn+2 is absent</li> <li>2) Mn+2 is absent</li> </ol>
V	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH + $(NH_4)_2CO_3$	White ppt is not formed	$Ba^{+2}$ (or) $Ca^{+2}$ are absent
VI	Salt solution + NaOH solution	1) White ppt is not formed	Mg <sup>+2</sup> is absent
	On heating	2) Pungent smell is evolved	May be $NH_4^+$

### **Confirmatory test for cations:**

### Confirmatory test for $NH_4^+$ ion:

S.No	Experiment	Observation	Inference	
1	1. Salt solution +Nessler's reagent ( $K_2[HgI_4]$ )	Reddish Brown ppt. It is also Called as Iodide of Millen 's Base	$\rm NH_4^+$ is confirmed	
<b><u>Result</u></b> : 1) Cation: $NH_4^+$ 2) Anion: $CO_3^{-2}$ 3) Salt: $(NH_4)_2CO_3$				

### **SALT ANALYSIS -V**

### I. Priliminary examinations:

1) <u>Colour</u> :	- Colour less
2) <u>State:</u>	- Crystalline solid
3) Odour:	- No odour

4) <u>Solubility</u>: - water soluble

5) Dry test:

S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry test tube and heat it	1) White sublimation is formed	<ol> <li>May be ammonium salt</li> </ol>

### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not observed	CO <sub>3</sub> <sup>-2 is absent</sup>
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	1) White fumes are evolved	May be Cl⁻

#### Confirmatory test for Cl<sup>-</sup> ion:

S.No	Experiment	Observation	Inference
1	Salt +MnO <sub>2</sub> powder +	Pale green fumes are evolved	Cl <sup>-</sup> is confirmed
2	Conc.H <sub>2</sub> SO <sub>4</sub> Salt sol +AgNO <sub>3</sub> sol	Curdy white ppt. It is soluble in NH <sub>4</sub> OH	Cl <sup>-</sup> is confirmed

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	Pb <sup>+2</sup> is absent
Π	Salt solution +dil.HCl +H <sub>2</sub> S gas	Black ppt is not formed	$Cu^{+2}$ is absent
III	Salt solution $+NH_4Cl + NH_4OH$	1)White gelatinous ppt is not formed	1) $Al^{+3}$ is absent 2) Fe <sup>+2</sup> is absent
IV	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH NH <sub>4</sub> OH +H <sub>2</sub> S gas	<ol> <li>2) Dark green ppt is not formed</li> <li>1) White ppt is not formed</li> <li>2) Flesh colour ppt is not formed</li> </ol>	<ol> <li>1) Zn<sup>+2</sup> is absent</li> <li>2) Mn<sup>+2</sup> is absent</li> </ol>
V	Salt solution $+NH_4Cl + NH_4OH + (NH_4)_2CO_3$	White ppt is not formed	$Ba^{+2}$ (or) $Ca^{+2}$ are absent
VI	Salt solution + NaOH solution	1) White ppt is not formed	Mg <sup>+2</sup> is absent
	On heating	2) Pungent smell is evolved	May be NH <sub>4</sub> <sup>+</sup>

### **Confirmatory test for NH**<sub>4</sub><sup>+</sup> **ion:**

S.No	Experiment	Observation	Inference
1	1. Salt solution +Nessler's reagent ( $K_2[HgI_4]$ )	Reddish Brown ppt. It is also Called as Iodide of Millen 's Base	$\rm NH_4^+$ is confirmed
Result	: 1) Cation: $NH_4^+$	2) Anion: Cl 3)	Salt: NH <sub>4</sub> Cl

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## **SALT ANALYSIS -VI**

#### I. Priliminary examinations:

1) <u>Colour</u>:

2) <u>State:</u>

3) <u>Odour</u>:

- Colour less
- Crystalline solid
- No odour - water soluble
- 4) Solubilit

4)	<u>Solubility:</u>
5)	Drv test:

S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry	1) White sublimation is formed	1) May be ammonium salt
	test tube and heat it		

### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not observed	CO3 <sup>-2</sup> is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	<ol> <li>White fumes are not evolved</li> <li>Reddish brown fumes are not</li> </ol>	<ol> <li>Cl<sup>-</sup> is absent</li> <li>Br<sup>-</sup> is absent</li> </ol>
3	Salt +Cu turnings + Conc.H <sub>2</sub> SO <sub>4</sub> and heat	evolved	_,
	strongly.	Reddish brown fumes are evolved	May be NO <sub>3</sub> -

### **Confirmatory test for NO**<sub>3</sub> **ion:**

S.No	Experiment	Observation	Inference
1	<b>Brown ring test:</b> 2 ml of salt solution +2ml of freshly prepared $FeSO_4$ solution and then the test tube kept in an inclined position and conc $H_2SO_4$ is added slowly along the sides of test tube.	A brown ring $[Fe.NO(H_2O)_5] SO_4$ is formed at the junction of the two liquid layers.	NO3 <sup>−</sup> is confirmed

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	Pb <sup>+2</sup> is absent
п	Salt solution +dil.HCl +H $_2$ S gas	Black ppt is not formed	Cu <sup>+2</sup> is absent 1) Al <sup>+3</sup> is absent
III	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH	formed	2) Fe <sup>+2</sup> is absent
IV	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH NH $_{4}$ OH $_{4}$ HeS gas	<ol> <li>Dark green ppt is not formed</li> <li>White ppt is not formed</li> </ol>	1) $Zn^{+2}$ is absent 2) $Mn^{+2}$ is absent
* 7		2) Flesh colour ppt is not formed	2) 1011
V	Salt solution $+NH_4Cl + NH_4OH + (NH_4)_2CO_3$	White ppt is not formed	$Ba^{+2}$ (or) $Ca^{+2}$ are absent
VI	Salt solution + NaOH solution	1) White ppt is not formed	Mg <sup>+2</sup> is absent
	On heating	2) Pungent smell is evolved	May be $NH_4^+$

### Confirmatory test for $NH_4^+$ ion:

S.No	Experiment	Observation	Inference
1	1. Salt solution +Nessler's reagent ( $K_2[HgI_4]$ )	Reddish Brown ppt. It is also Called as Iodide of Millen 's Base	$\rm NH_4^+$ is confirmed

1) Cation:  $NH_4^+$  2) Anion:  $NO_3^-$ **<u>Result</u>**:

3) Salt:: NH<sub>4</sub>NO<sub>3</sub>

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### **SALT ANALYSIS -VII**

### I. Priliminary examinations:

- 1) <u>Colour</u>: - Colour less 2) <u>State:</u> - Crystalline solid

  - 3) <u>Odour</u>:
  - 4) <u>Solubility</u>: 5) Drv test:

	/		
S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry test tube and heat it	1) White sublimation is formed	1) May be ammonium salt

- No odour

- water soluble

### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not Observed	$CO_3^{-2}$ is absent
2	Salt +Conc.H $_2$ SO $_4$	<ol> <li>White fumes are not evolved</li> <li>Reddish brown fumes are not evolved</li> </ol>	1) Cl <sup>-</sup> is absent 2) Br <sup>-</sup> is absent
3	Salt +Cu turnings + Conc. $H_2SO_4$ and heat strongly.	Reddish brown fumes are not evolved	NO <sub>3</sub> - is absent
4	Salt sol + $BaCl_2$ sol.	White ppt is formed	May be $SO_4^{-2}$

### **Confirmatory test for SO<sub>4</sub>**-<sup>2</sup>**ion:**

S.No	Experiment	Observation	Inference
1	Salt solution+lead acetate solution	White ppt is formed It is insoluble in Conc.HCl	$SO_4^{-2}$ is confirmed

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	Pb <sup>+2</sup> is absent
II	Salt solution +dil.HCl +H <sub>2</sub> S gas	Black ppt is not formed 1)White gelatinous ppt is not	Cu <sup>+2</sup> is absent 1) Al <sup>+3</sup> is absent
III IV	Salt solution $+NH_4Cl + NH_4OH$ Salt solution $+NH_4Cl + NH_4OH$	formed 2) Dark green ppt is not formed	2) Fe <sup>+2</sup> is absent
v	NH <sub>4</sub> OH +H <sub>2</sub> S gas	<ol> <li>White ppt is not formed</li> <li>Flesh colour ppt is not formed</li> </ol>	2) $Mn^{+2}$ is absent
	$(NH_4)_2CO_3$	White ppt is not formed	$Ba^{+2}$ (or) $Ca^{+2}$ are absent
VI	Salt solution + NaOH solution	SS2) Pungent smell is evolved	$Mg^{+2}$ is absent
	On heating		May be $NH_4^+$

### **Confirmatory test for NH\_4^+ ion:**

S.No	Experiment	Observation	Inference
1	1. Salt solution +Nessler's reagent ( $K_2[HgI_4]$ )	Reddish Brown ppt. It is also Called as Iodide of Millen 's Base	$\rm NH_4^+$ is confirmed
D		a + c = -2	

<u>**Result</u>**: 1) Cation:  $NH_4^+$  2) Anion:  $SO_4^{-2}$ </u>

### **SALT ANALYSIS - VIII**

### **<u>I. Priliminary examinations:</u>**

- 1) <u>Colour</u>: - Colour less - Crystalline solid
- 2) <u>State:</u>
- 3) <u>Odour</u>:
- No odour
- 4) Solubility:
- water soluble
- 5) Dry test:

S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry test tube and heat it	Looses water	May be hydrated salt

### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not observed	CO <sub>3</sub> -2 is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	Reddish brown fumes are evolved	Br <sup>- is absent</sup>

#### Confirmatory test for Br<sup>-</sup> ion:

S.No	Experiment	Observation	Inference
1	Salt +MnO <sub>2</sub> powder	Reddish brown fumes are	Br-is confirmed
2	+Conc.H <sub>2</sub> SO <sub>4</sub>	evolved	Br⁻is confirmed
	Salt solution +AgNO <sub>3</sub> sol	Yellow colour ppt is formed. It is partially soluble in NH <sub>4</sub> OH	

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	$Pb^{+2}$ is absent
II III	Salt solution +dil.HCl +H <sub>2</sub> S gas Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH	<ol> <li>Black ppt is not formed</li> <li>White gelatinous ppt is not formed</li> <li>Dark green ppt is not formed</li> </ol>	Cu <sup>+2</sup> is absent 1) Al <sup>+3</sup> is absent 2) Fe <sup>+2</sup> is absent
IV	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH NH <sub>4</sub> OH +H <sub>2</sub> S gas	<ol> <li>White ppt is not formed</li> <li>Flesh colour ppt is not formed</li> </ol>	<ol> <li>1) Zn+2 is absent</li> <li>2) Mn+2 is absent</li> </ol>
V	Salt solution $+NH_4Cl + NH_4OH + (NH_4)_2CO_3$	White ppt is formed	May be $Ba^{+2}$ (or) $Ca^{+2}$

### Confirmatory test for Ca<sup>+2</sup>/Ba<sup>+2</sup> ion:

S.No	Experiment	Observation	Inference
1	Salt solution $+K_2CrO_4$ sol	2. Yellow ppt is formed	$Ba^{+2}$ is confirmed

**Result :** 1) Cation:  $Ba^{+2}$ 

2) Anion: Br<sup>-</sup>

3) Salt: BaBr<sub>2</sub>

# **SALT ANALYSIS - IX**

### **I.** Priliminary examinations:

- 1) Colour: - Colour less 2) State:
  - Crystalline solid

- water soluble

- 3) <u>Odour</u>: - No odour
- 4) Solubility:
- 5) Dry test:

S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry test tube and heat it	Looses water	May be hydrated salt

### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not observed	CO <sub>3</sub> <sup>-2</sup> is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	White fumes are evolved	May be Cl <sup>- t</sup>

#### Confirmatory test for Cl<sup>-</sup>ion:

S.No	Experiment	Observation	Inference
1	Salt +MnO <sub>2</sub> powder +	Pale green fumes are evolved	Cl <sup>-</sup> is confirmed
2	$Conc.H_2SO_4$ Salt sol +AgNO <sub>3</sub> sol	Curdy white ppt. It is soluble in $NH_4OH$	Cl <sup>-</sup> is confirmed

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	$Pb^{+2}$ is absent
II III	Salt solution +dil.HCl +H <sub>2</sub> S gas Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH	<ol> <li>Black ppt is not formed</li> <li>White gelatinous ppt is not formed</li> <li>Dark green ppt is not formed</li> </ol>	Cu <sup>+2</sup> is absent 1) Al <sup>+3</sup> is absent 2) Fe <sup>+2</sup> is absent
IV	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH NH <sub>4</sub> OH +H <sub>2</sub> S gas	<ol> <li>White ppt is not formed</li> <li>Flesh colour ppt is not formed</li> </ol>	<ol> <li>1) Zn<sup>+2</sup> is absent</li> <li>2) Mn<sup>+2</sup> is absent</li> </ol>
V	Salt solution $+NH_4Cl + NH_4OH + (NH_4)_2CO_3$	White ppt is formed	May be $Ba^{+2}$ (or) $Ca^{+2}$

#### **Confirmatory test for cations:** +2 •

<u>Confirmatory test for Ca<sup>+2</sup>/Ba<sup>+2</sup> ion:</u>			<u>n:</u>	
	S.No	Experiment	Observation	Inference
	1	Salt solution $+K_2CrO_4$ sol	2. Yellow ppt is formed	$Ba^{+2}$ is confirmed

1) Cation:  $Ba^{+2}$ **Result :** 

2) Anion: Cl<sup>-</sup>

3) Salt: BaCl<sub>2</sub>

### **SALT ANALYSIS - X**

### I. Priliminary examinations:

- 1) <u>Colour</u>: - Colour less 2) <u>State:</u> - Crystalline solid
- 3) <u>Odour</u>: - No odour - water soluble
- 4) <u>Solubility</u>:
- 5) Drv test:

S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry	1) Looses water	1) May be hydrated salt
	test tube and heat it		

### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not observed	CO3 <sup>-2</sup> is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	<ol> <li>White fumes are not evolved</li> <li>Reddish brown fumes are not evolved</li> </ol>	<ol> <li>Cl<sup>-</sup> is absent</li> <li>Br<sup>-</sup> is absent</li> </ol>
3	Salt +Cu turnings + Conc.H $_2$ SO $_4$ and heat strongly.	Reddish brown fumes are evolved	May be NO <sub>3</sub> ⁻

### <u>Confirmatory test for NO<sub>3</sub><sup>-</sup> ion:</u>

S.No	Experiment	Observation	Inference
1	<b>Brown ring test:</b> 2 ml of salt solution +2ml of freshly prepared FeSO <sub>4</sub> solution and then	A brown ring $[Fe.NO(H_2O)_5] SO_4$ is	NO <sub>3</sub> <sup>-</sup> is confirmed
	the test tube kept in an inclined position and conc $H_2SO_4$ is added slowly along the sides of test tube.	tormed at the junction of the two liquid layers.	

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	$Pb^{+2}$ is absent
П	Salt solution +dil.HCl +H <sub>2</sub> S gas	Black ppt is not formed	$Cu^{+2}$ is absent
ΠΙ	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH	<ol> <li>White gelatinous ppt is not formed</li> <li>Dark green ppt is not formed</li> </ol>	1) $Al^{+3}$ is absent 2) Fe <sup>+2</sup> is absent
IV	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH NH <sub>4</sub> OH +H <sub>2</sub> S gas	<ol> <li>White ppt is not formed</li> <li>Flesh colour ppt is not formed</li> </ol>	<ol> <li>1) Zn<sup>+2</sup> is absent</li> <li>2) Mn<sup>+2</sup> is absent</li> </ol>
V	Salt solution $+NH_4Cl + NH_4OH + (NH_4)_2CO_3$	White ppt is formed	May be $Ba^{+2}$ (or) $Ca^{+2}$

#### ion: <u>Confirmatory test for Ca<sup>+2</sup>/Ba<sup>+</sup></u>

S.No	Experiment	Observation	Inference
1	Salt solution $+K_2CrO_4$ sol	2. Yellow ppt is formed	$Ba^{+2}$ is confirmed

#### 1) Cation: $Ba^{+2}$ Result :

**2)** Anion:  $NO_3^-$  **3)** Salt: Ba  $(NO_3)_2$ 

### **SALT ANALYSIS - XI**

I. P	riliminary examinations:				
$\overline{1}$	<u>Colour:</u> - Colou	r less			
2) <u>S</u>	tate: - Crysta	alline s	olid		
3) <u>C</u>	<u>)dour</u> : - No od	our			
4) <u>S</u>	<u>olubility</u> : - water	solubl	e		
<u>5) D</u>	bry test:				
S.No	Experiment			Observation	Inference
1	Take a pinch of salt in a dry tube and heat it	t	est	Looses water	May be hydrated salt
II) II	DENTIFICATION OF ANI	ON:			
S.No	Experiment			Observation	Inference
1	Salt +dil.HCl	Brisk	efferv	escences are not observe	d $CO_3^{-2}$ is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	c.H <sub>2</sub> SO <sub>4</sub> White fumes are evolved		May be Cl⁻	
	<u>Confirmatory test for Cl<sup>-</sup> ion:</u>				
S.No	Experiment	Experiment Observation		Observation	Inference
1	Salt +MnO <sub>2</sub> powder + Conc.H <sub>2</sub> S	so <sub>4</sub>	Pale	green fumes are evolved	Cl <sup>-</sup> is confirmed
2	Salt sol + AgNO <sub>3</sub> sol	gNO <sub>3</sub> sol Curdy whit in NH <sub>4</sub> OH		y white ppt. It is soluble H <sub>4</sub> OH	Cl <sup>-</sup> is confirmed
II	III) IDENTIFICATION OF CATION:				
G.No	Experiment		(	Observation	Inference
Ι	Salt solution +dil.HCl		White	ppt is not formed	Pb <sup>+2</sup> is absent
II	Salt solution +dil.HCl +H $_{2}$ S gas	]	Black	ppt is not formed	Cu <sup>+2</sup> is absent
ш	Salt solution $+NH_4Cl_+ NH_4OH_4$	1) V	Vhite g	elatinous ppt is not	1) Al <sup>+3</sup> is absent
111		form	ned		$a_{1} = 12$ is absent
IV	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH	2)	Dark g	reen ppt is not formed	2) $Fe^{\pm 2}$ is absent
	$NH_4OH + H_2S$ gas	1)	White	ppt is not formed	1) $Zn^{+2}$ is absent
V		2)	Flesh c	colour ppt is not formed	2) $Mn^{+2}$ is absent
v	Salt solution $+NH_4CI + NH_4OH$				
	$+(\mathrm{NH}_4)_2\mathrm{CO}_3$	Wh	ite ppt	is formed	May be $Ba^{+2}$ (or) $Ca^{+2}$

Confirmatory test for Ca <sup>+2</sup>/ Ba<sup>+2</sup> ion:

S.No	Experiment	Observation	Inference
1	Salt solution $+K_2CrO_4$ sol	1. No ppt	$Ca^{+2}$ is confirmed

**<u>Result</u>**: 1) Cation: Ca<sup>+2</sup>

2) Anion: Cl<sup>-</sup>

**3)** Salt: Ca  $Cl_2$ 

# SALT ANALYSIS - XII

### I. Priliminary examinations:

- 1) <u>Colour</u>: 2) <u>State:</u>
- Colour less
- Crystalline solid
- No odour
- 4) <u>Solubility</u>:

-	water	soluble	9

5) Dry test:

3) <u>Odour</u>:

S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry	1) Looses water	1) May be hydrated salt
	test tube and heat it		

### **II) IDENTIFICATION OF ANION:**

j $i D D$			
S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not observed	CO <sub>3</sub> <sup>-2</sup> is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	<ol> <li>White fumes are not evolved</li> <li>Reddish brown fumes are not evolved</li> </ol>	<ol> <li>Cl<sup>-</sup> is absent</li> <li>Br<sup>-</sup> is absent</li> </ol>
3	Salt +Cu turnings + Conc.H <sub>2</sub> SO <sub>4</sub> and heat strongly.	Reddish brown fumes are evolved	May be NO <sub>3</sub> ⁻

### <u>Confirmatory test for $NO_3^-$ ion:</u>

S.No	Experiment	Observation	Inference
1	<b>Brown ring test:</b> 2 ml of salt solution +2ml of freshly prepared $FeSO_4$ solution and then the test tube kept in an inclined position and conc $H_2SO_4$ is added slowly along the sides of test tube.	A brown ring $[Fe.NO(H_2O)_5] SO_4$ is formed at the junction of the two liquid layers.	NO3 <sup>-</sup> is confirmed

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	$Pb^{+2}$ is absent
II	Salt solution +dil.HCl +H <sub>2</sub> S gas	Black ppt is not formed	$Cu^{+2}$ is absent
III	Salt solution $+NH_4Cl + NH_4OH$	1) White gelatinous ppt is not formed	1) Al <sup>+5</sup> is absent
IV	Salt solution $+NH_4Cl + NH_4OH$	<ul><li>2) Dark green ppt is not formed</li><li>1) White ppt is not formed</li></ul>	2) Fe <sup>+2</sup> is absent 1) Zn <sup>+2</sup> is absent
V	$NH_4OH + H_2S$ gas Salt solution + $NH_4Cl + NH_4OH$	2) Flesh colour ppt is not formed	2) $Mn^{+2}$ is absent
	$+ (NH_4)_2CO_3$	White ppt is formed	May be $Ba^{+2}$ (or) $Ca^{+2}$

### **Confirmatory test for Ca**<sup>+2</sup>/**Ba**<sup>+2</sup> ion:

S.No	Experiment	Observation	Inference
1	Salt solution $+K_2CrO_4$ sol	1. No ppt	Ca <sup>+2</sup> is confirmed

**<u>Result</u>**: 1) Cation:  $Ca^{+2}$ 

2) Anion: NO<sub>3</sub><sup>-</sup>

3) Salt: Ca (NO<sub>3</sub>)<sub>2</sub>

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### **SALT ANALYSIS - XIII**

### I. Priliminary examinations:

- 1) <u>Colour</u>: 2) <u>State:</u>
- BlueColour
- Crystalline solid
- No odour
- 4) <u>Solubility</u>:
- Water soluble
- 5) Dry test:

3) <u>Odour</u>:

S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry	1) Looses water	1) May be hydrated salt
	test tube and heat it		

### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not observed	CO <sub>3</sub> <sup>-2</sup> is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	<ol> <li>White fumes are not evolved</li> <li>Reddish brown fumes are not evolved</li> </ol>	<ol> <li>Cl<sup>- is absent</sup></li> <li>Br<sup>- is absent</sup></li> </ol>
3	Salt +Cu turnings + Conc.H <sub>2</sub> SO <sub>4</sub> and heat strongly.	Reddish brown fumes are evolved	May be NO <sub>3</sub> ⁻

### Confirmatory test for NO<sub>3</sub><sup>-</sup> ion:

S.No	Experiment	Observation	Inference
1	<b>Brown ring test:</b> 2 ml of salt solution +2ml	A brown ring	NO <sub>3</sub> -is
	of freshly prepared FeSO <sub>4</sub> solution and then	[Fe.NO( $H_2O$ ) <sub>5</sub> ] SO <sub>4</sub> is	confirmed
	the test tube kept in an inclined position and $conc.$ HeSQ4 is added slowly along the sides	formed at the junction of the two liquid layers	
	of test tube.	the two inquite injers.	

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	Pb <sup>+2</sup> is absent
Π	Salt solution +dil.HCl +H <sub>2</sub> S gas	Black ppt is formed	May be Cu <sup>+2</sup>

### **Confirmatory test for Cu<sup>+2</sup> ion:**

S.No	Experiment	Observation	Inference
1	1. Salt solution + $K_4[Fe(CN)_6]$	Chacolate Brown ppt	$Cu^{+2}$ is confirmed
	2. Salt solution+NaOH sol	Blue Colour ppt	$Cu^{+2}$ is confirmed

**<u>Result</u>**: 1) Cation:  $Cu^{+2}$ 

**2)** Anion:  $NO_3^-$ 

3) Salt: Cu(NO<sub>3</sub>)<sub>2</sub>

## **SALT ANALYSIS - XIV**

### I. Priliminary examinations:

- 1) <u>Colour</u>: - BlueColour 2) **State:** 
  - Crystalline solid
  - No odour
- 3) <u>Odour</u>: 4) Solubility:
- 5) Dry test:

- water soluble	-	water	soluble
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0) 21	<u>,</u>		
S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry	1) Looses water	1) May be hydrated salt
	test tube and heat it		

### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not Observed	$CO_3^{-2}$ is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	1) White fumes are not evolved	1) ci- is absent
		2) Reddish brown fumes are not evolved	1) Cl <sup>15</sup> dobeint
3	Salt +Cu turnings + Conc.	Reddish brown fumes are not evolved	2) Br <sup>- is absent</sup> NO <sub>2</sub> - is absent
	$H_2 SO_4$ and neat strongly.		1.03
4	Salt sol + BaCl <sub>2</sub> sol.	White ppt is formed	May be SO <sub>4</sub> <sup>-2</sup>
	-		

### **Confirmatory** test for $SO_4^{-2}$ ion:

S.No	Experiment	Observation	Inference
1	Salt solution+lead acetate solution	White ppt is formed It is insoluble in Conc.HCl	$SO_4^{-2}$ is confirmed

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	Pb <sup>+2</sup> is absent
Π	Salt solution +dil.HCl +H <sub>2</sub> S gas	Black ppt is formed	May be Cu <sup>+2</sup>

### Confirmatory test for Cu<sup>+2</sup> ion:

S.No	Experiment	Observation	Inference
1	1. Salt solution + $K_4[Fe(CN)_6]$	Chacolate Brown ppt	$Cu^{+2}$ is confirmed
	2. Salt solution+NaOH sol	Blue Colour ppt	$Cu^{+2}$ is confirmed

**<u>Result</u>**: 1) Cation:  $Cu^{+2}$  2) Anion:  $SO_4^{-2}$ 

3) Salt: CuSO<sub>4</sub>

1) Colour:

### **SALT ANALYSIS - XV** I. Priliminary examinations:

- Pale green colour

2) 3)	2) <u>State:</u> - Crystalline solid 3) Odour: - No odour					
(3) (4)	) <u>Ou</u> ) Soli	<u>ubility:</u> - wate	er soluble			
5) <u>Dry test:</u>						
S.N	No	Experiment	Observation		Inference	
1	,	Take a pinch of salt in a dry	1) Looses water	Ma	May be hydrated salt	
	1	test tube and heat it				
II) IDENTIFICATION OF ANION:						
S.	No	Experiment	Observation		Inference	
1		Salt +dil.HCl	Brisk effervescences are not observed	1	CO <sub>3</sub> <sup>-2</sup> is absent	
2		Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	1) White fumes are not evolved	1) CI- is absent		
			2) Reddish brown fumes are not evolv	ved 2) $Br^{-}$ is absent		
3		Salt +Cu_turnings +Conc		,		
		$H_2SO_4$ and heat strongly.	Reddish brown fumes are not evolved	$NO_3^{-}$ is absent		
4		Salt sol + $BaCl_2$ sol.	White ppt is formed		May be SO <sub>4</sub> <sup>-2</sup>	
С	onfi	rmatory test for SO <sub>4</sub> -2 ion:				
S.N	No	Experiment	Observation		Inference	
1		Salt solution+lead acetate solution	White ppt is formed It is insoluble in Conc.HCl	SO	$4^{-2}$ is confirmed	
III)	I	DENTIFICATION O	F CATION:			
<b>G.</b> ]	No	Experiment	Observation		Inference	
Ι		Salt solution +dil.HCl	White ppt is not formed	Pb <sup>+</sup>	<sup>2</sup> is absent	
П		Salt solution +dil.HCl +H <sub>2</sub> S gas	s Black ppt is not formed	$Cu^{+2}$ is absent		
III	III Salt solution $+NH_4Cl + NH_4OH$		OH 1) Dark green ppt is formed	May be Fe <sup>+2</sup>		
Cor	nfirr	matory test for Fe <sup>+2</sup> ion:				
		Experiment	Observation		Inference	
1	Salt	solution +NaOH sol	Dark Green Ppt	Fe <sup>+</sup>	<sup>2</sup> is confirmed	

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Result :

1) Cation:  $Fe^{+2}$ 

2) Anion: SO<sub>4</sub><sup>-2</sup>

3) Salt: FeSO<sub>4</sub>

# **SALT ANALYSIS - XVI**

### I. Priliminary examinations:

1) <u>Colour</u>:

2) State:

3) Odour:

- Colour less
- Crystalline solid
- No odour
- 4) Solubility:
- water soluble

### 5) <u>Dry tes</u>t:

S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry	1) Looses water	1) May be hydrated salt
	test tube and heat it		

### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not observed	CO <sub>3</sub> <sup>-2</sup> is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	<ol> <li>White fumes are not evolved</li> <li>Reddish brown fumes are not evolved</li> </ol>	<ol> <li>Cl<sup>-</sup> is absent</li> <li>Br<sup>-</sup> is absent</li> </ol>
3	Salt +Cu turnings + Conc.H <sub>2</sub> SO <sub>4</sub> and heat strongly.	Reddish brown fumes are evolved	May be NO <sub>3</sub> ⁻

### **Confirmatory test for NO**<sub>3</sub> **ion:**

	<u> </u>		
S.No	Experiment	Observation	Inference
1	<b>Brown ring test:</b> 2 ml of salt solution +2ml of freshly prepared $FeSO_4$ solution and then the test tube kept in an inclined position and conc $H_2SO_4$ is added slowly along the sides of test tube.	A brown ring [Fe.NO( $H_2O_{5}$ ] SO <sub>4</sub> is formed at the junction of the two liquid layers.	NO <sub>3</sub> <sup>-</sup> is confirmed

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference	
Ι	Salt solution +dil.HCl	White ppt is formed	May be Pb <sup>+2</sup>	
Confirmatory test for $\mathbf{Ph}^{+2}$ ion:				

Com	irmatory test for PD ton:		
S.No	Experiment	Observation	Inference
1	Salt solution+ $K_2$ CrO <sub>4</sub> sol.	Yellow ppt is formed It is insoluble in HNO <sub>3</sub>	Pb <sup>+2</sup> is confirmed
Resul	<b><u>t</u>:</b> 1) Cation: Pb <sup>+2</sup>	2) Anion: $NO_3$ 3) Saturation 3) Saturation 3)	alt: Pb(NO <sub>3</sub> ) <sub>2</sub>

# **SALT ANALYSIS -XVII**

### **<u>I. Priliminary examinations:</u>**

- 1) <u>Colour</u>: Colour less
- 2) <u>State:</u> Crystalline solid
- 3) Odour: No odour
- 4) <u>Solubility</u>:
- water soluble
- 5) Dry test:

S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry test tube and heat it	Looses water	May be hydrated salt

### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not observed	CO <sub>3</sub> <sup>-2</sup> is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	1) White fumes are evolved	May be Cl⁻

#### Confirmatory test for Cl<sup>-</sup> ion:

S.No	Experiment	Observation	Inference
1	Salt +MnO <sub>2</sub> powder +	Pale green fumes are evolved	Cl <sup>-</sup> is confirmed
2	Conc.H $_2$ SO $_4$ Salt sol +AgNO $_3$ sol	Curdy white ppt. It is soluble in $NH_4OH$	Cl <sup>-</sup> is confirmed

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	Pb <sup>+2</sup> is absent
Π	Salt solution +dil.HCl +H <sub>2</sub> S gas	Black ppt is not formed	$Cu^{+2}$ is absent
III	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH	<ol> <li>White gelatinous ppt is not formed</li> <li>Dark green ppt is f not ormed</li> </ol>	2) $Fe^{+2}$ is absent
IV	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH NH <sub>4</sub> OH +H <sub>2</sub> S gas	<ol> <li>White ppt is not formed</li> <li>Flesh colour ppt is not formed</li> </ol>	<ol> <li>1) Zn<sup>+2</sup> is absent</li> <li>2) Mn<sup>+2</sup> is absent</li> </ol>
V	Salt solution $+NH_4Cl + NH_4OH + (NH_4)_2CO_3$	White ppt is not formed	Ba <sup>+2</sup> (or) Ca <sup>+2</sup> are absent
VI	Salt solution + NaOH solution	White ppt is formed	May be Mg <sup>+2</sup>

### Confirmatory test for Mg<sup>+2</sup>ion:

	S.No	Experiment	Observation	Inference
	1	Salt solution + $(NH_4)_2CO_3$ solution	Slowly White ppt is formed	Mg+2 is confirmed
]	Result :	<b>1) Cation: Mg</b> <sup>+2</sup>	2) Anion: Cl <sup>-</sup> 3) Salt	: MgCl <sub>2</sub>

### **SALT ANALYSIS - XVIII**

### I. Priliminary examinations:

- 1) <u>Colour</u>: - Colour less
- 2) State:
- Crystalline solid
- 3) <u>Odour</u>: - No odour - water soluble
- 4) Solubility:
- 5) Dry test:

S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry	1) Looses water	1) May be hydrated salt
	test tube and heat it		

### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not observed	CO <sub>3</sub> <sup>-2</sup> is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	<ol> <li>White fumes are not evolved</li> <li>Reddish brown fumes are not evolved</li> </ol>	<ol> <li>Cl<sup>-</sup> is absent</li> <li>Br<sup>-</sup> is absent</li> </ol>
3	Salt +Cu turnings + Conc.H <sub>2</sub> SO <sub>4</sub> and heat strongly.	Reddish brown fumes are evolved	May be NO3⁻

### <u>Confirmatory test for NO, ion:</u>

S.No	Experiment	Observation	Inference
1	<b>Brown ring test:</b> 2 ml of salt solution +2ml of freshly prepared $FeSO_4$ solution and then the test tube kept in an inclined position and conc $H_2SO_4$ is added slowly along the sides of test tube.	A brown ring $[Fe.NO(H_2O)_5] SO_4$ is formed at the junction of the two liquid layers.	NO <sub>3</sub> <sup>-</sup> is confirmed

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	$Pb^{+2}$ is absent
Π	Salt solution +dil.HCl +H <sub>2</sub> S gas	Black ppt is not formed	$Cu^{+2}$ is absent
III	Salt solution $+NH_4Cl + NH_4OH$	1) White gelatinous ppt is not formed	2) $Fe^{+2}$ is absent
IV	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH	2) Dark green ppt is f not ormed	1) Zn <sup>+2</sup> is absent
	NH <sub>4</sub> OH +H <sub>2</sub> S gas	<ol> <li>White ppt is not formed</li> <li>Flesh colour ppt is not formed</li> </ol>	2) $Mn^{+2}$ is absent
V	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH +	White ppt is not formed	Ba <sup>+2</sup> (or) Ca <sup>+2</sup> are absent
VI	$(NH_4)_2CO_3$ Salt solution + NaOH solution	White ppt is formed	May be Mg <sup>+2</sup>

### **Confirmatory test for Mg**<sup>+2</sup>**ion:**

S.No	Experiment	Observation	Inference
1	Salt solution + $(NH_4)_2CO_3$ solution	Slowly White ppt is formed	Mg+2 is confirmed

**Result**: 1) Cation: 
$$Mg^{+2}$$

2) Anion: NO<sub>3</sub>

3) Salt:  $Mg(NO_3)_2$ 

# **SALT ANALYSIS - XIX**

### I. Priliminary examinations:

- 1) <u>Colour</u>:
- Colourless - Crystalline solid
- 2) State:- Crystalline3) Odour:- No odour
- 3) <u>Odour</u>:- No odour4) <u>Solubility</u>:- water soluble
- 4) <u>Solubility</u>: 5) Dry test:

$5) \underline{Diy} \underline{cs}t.$			
S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry	Looses water	May be hydrated salt
	test tube and heat it		

### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not observed	CO <sub>3</sub> <sup>-2</sup> is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	1) White fumes are not evolved	1) Cl <sup>- is absent</sup>
		2) Reddish brown fumes are not evolved	2) Br <sup>- is absent</sup>
3	Salt +Cu turnings +Conc. $H_2SO_4$ and heat strongly.	Reddish brown fumes are not evolved	NO <sub>3</sub> - is absent
4	Salt sol + $BaCl_2$ sol.	White ppt is formed	May be $SO_4^{-2}$

### **Confirmatory test for SO**<sub>4</sub><sup>-2</sup>**ion:**

S.No	Experiment	Observation	Inference
1	Salt solution+lead acetate	White ppt is formed	$SO_4^{-2}$ is confirmed
	solution	It is insoluble in Conc.HCl	+

### **III) IDENTIFICATION OF CAT ION:**

G.No	Experiment	Observation	Inference			
Ι	Salt solution +dil.HCl	White ppt is not formed	Pb <sup>+2</sup> is absent			
II III	Salt solution +dil.HCl +H <sub>2</sub> S gas Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH	<ul><li>Black ppt is not formed</li><li>1) White gelatinous ppt is not formed</li><li>2) Dark green ppt is f not ormed</li></ul>	Cu <sup>+2</sup> is absent 1) AI <sup>+3</sup> is absent 2) Fe <sup>+2</sup> is absent			
IV	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH NH <sub>4</sub> OH +H <sub>2</sub> S gas	<ol> <li>White ppt is not formed</li> <li>Flesh colour ppt is not formed</li> </ol>	<ol> <li>1) Zn<sup>+2</sup> is absent</li> <li>2) Mn<sup>+2</sup> is absent</li> </ol>			
V	Salt solution $+NH_4Cl + NH_4OH + (NH_4)_2CO_3$	White ppt is not formed	Ba <sup>+2</sup> (or) Ca <sup>+2</sup> are absent			
VI	Salt solution + NaOH solution	White ppt is formed	May be Mg <sup>+2</sup>			
Confir	matory test for Mg <sup>+2</sup> ion:	Confirmatory test for Mg <sup>+2</sup> ion:				

	S.No	Experiment	Observation	Inference
	1	Salt solution + $(NH_4)_2CO_3$ solution	Slowly White ppt is formed	Mg+2 is confirmed
Re	esult :	1) Cation: Mg <sup>+2</sup>	2) Anion: SO <sub>4</sub> <sup>-2</sup> 3) \$	Salt: MgSO4

### **SALT ANALYSIS -XX**

### **I. Priliminary examinations:**

- 1) Colour:- Pink Colour2) State:- Crystalline solid3) Odour:- No odour
- 4) <u>Solubility</u>: water soluble 5) Dry test:

$3) \underline{D} \underline{Y}$	$5) \underline{D1y} \underline{tes}i.$				
S.No	Experiment	Observation	Inference		
1	Take a pinch of salt in a dry test tube and heat it	Looses water	May be hydrated salt		

#### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not observed	CO <sub>3</sub> <sup>-2</sup> is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	White fumes are evolved	May be Cl⁻

#### Confirmatory test for Cl<sup>-</sup> ion:

S.No	Experiment	Observation	Inference
1	Salt +MnO <sub>2</sub> powder +	Pale green fumes are evolved	Cl <sup>-</sup> is confirmed
2	Conc.H <sub>2</sub> SO <sub>4</sub> Salt sol +AgNO <sub>3</sub> sol	Curdy white ppt. It is soluble in NH <sub>4</sub> OH	Cl <sup>-</sup> is confirmed

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	$Pb^{+2}$ is absent
Π	Salt solution +dil.HCl +H <sub>2</sub> S gas	Black ppt is not formed	$Cu^{+2}$ is absent
III	Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH	<ol> <li>White gelatinous ppt is not formed</li> <li>Dark green ppt is f not ormed</li> </ol>	<ol> <li>Al<sup>+5</sup> is absent</li> <li>Fe<sup>+2</sup> is absent</li> </ol>
IV	Salt solution $+NH_4Cl + NH_4OH$ $NH_4OH + H_2S$ gas	Flesh colour ppt is formed	May be Mn <sup>+2</sup>

### **Confirmatory test for Mn<sup>+2</sup> ion:**

S.No	Experiment	Observation	Inference
1	1. Salt solution +NaOH sol	Slowly Reddish Brown ppt is formed	Mn <sup>+2</sup> is confirmed
Resul	<u>t</u> : 1) Cation: Mn <sup>+2</sup>	2) Anion: Cl <sup>-</sup> 3	B) Salt: MnCl <sub>2</sub>

### **SALT ANALYSIS -XXI**

### **<u>I. Priliminary examinations:</u>**

- 1) Colour:
   Pink Colour
- 2) <u>State:</u>
- Crystalline solid
- 3) Odour: No odour
- 4) Solubility:
- water soluble
- 5) <u>Dry tes</u>t:

S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry test tube and heat it	Looses water	May be hydrated salt

### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not observed	CO <sub>3</sub> <sup>-2</sup> is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	1) White fumes are not evolved	1) Cl <sup>- is absent</sup>
		2) Reddish brown fumes are not evolved	2) Br <sup>- is absent</sup>
3	Salt +Cu turnings +Conc.		
	$H_2SO_4$ and heat strongly.	Reddish brown fumes are not evolved	NO <sub>3</sub> - is absent
4	Salt sol + $BaCl_2$ sol.	White ppt is formed	May be $SO_4^{-2}$

#### **Confirmatory test for SO**<sub>4</sub>-<sup>2</sup>**ion:**

S.No	Experiment	Observation	Inference
1	Salt solution+lead acetate solution	White ppt is formed It is insoluble in Conc.HCl	$SO_4^{-2}$ is confirmed

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	$Pb^{+2}$ is absent
II III	Salt solution +dil.HCl +H <sub>2</sub> S gas Salt solution +NH <sub>4</sub> Cl + NH <sub>4</sub> OH	<ol> <li>Black ppt is not formed</li> <li>White gelatinous ppt is not formed</li> <li>Dark green ppt is f not ormed</li> </ol>	Cu <sup>+2</sup> is absent 1) Al <sup>+3</sup> is absent 2) Fe <sup>+2</sup> is absent
IV	Salt solution $+NH_4Cl + NH_4OH$ $NH_4OH + H_2S$ gas	Flesh colour ppt is formed	May be Mn <sup>+2</sup>

### **Confirmatory test for Mn<sup>+2</sup> ion:**

S.No	Experiment	Observation	Inference
1	1. Salt solution +NaOH sol	Slowly Reddish Brown ppt is formed	Mn <sup>+2</sup> is
			confirmed
Result :	1) Cation: Mn <sup>+2</sup>	2) Anion: $SO_4^{-2}$ 3) Sa	alt: MnSO <sub>4</sub>

### **SALT ANALYSIS - XXII**

### I. Priliminary examinations:

1) <u>Colour</u> :	- Colourless
2) State:	- Crystalline solid
3) Odour:	- No odour
4) Solubility:	- water soluble
5) Dry tost.	

$3) \mathbf{D}$	y icsi.		
S.No	Experiment	Observation	Inference
1	Take a pinch of salt in a dry	Looses water	May be hydrated salt
	test tube and heat it		

### **II) IDENTIFICATION OF ANION:**

S.No	Experiment	Observation	Inference
1	Salt +dil.HCl	Brisk effervescences are not observed	CO <sub>3</sub> <sup>-2</sup> is absent
2	Salt +Conc.H <sub>2</sub> SO <sub>4</sub>	1) White fumes are not evolved	1) Cl <sup>- is absent</sup>
		2) Reddish brown fumes are not evolved	2) Br <sup>- is absent</sup>
3	Salt +Cu turnings +Conc.		
	$H_2SO_4$ and heat strongly.	Reddish brown fumes are not evolved	NO <sub>3</sub> - is absent
4	Salt sol + $BaCl_2$ sol.	White ppt is formed	May be $SO_4^{-2}$

### **Confirmatory test for SO**<sub>4</sub>-<sup>2</sup>**ion:**

S.No	Experiment	Observation	Inference
1	Salt solution+lead acetate solution	White ppt is formed It is insoluble in Conc.HCl	$SO_4^{-2}$ is confirmed

### **III) IDENTIFICATION OF CATION:**

G.No	Experiment	Observation	Inference
Ι	Salt solution +dil.HCl	White ppt is not formed	May be Pb <sup>+2</sup>
Π	Salt solution +dil.HCl +H <sub>2</sub> S gas	Black ppt is not formed	May be Cu <sup>+2</sup> 1) May be Al <sup>+3</sup>
ΠΙ	Salt solution $+NH_4Cl + NH_4OH$	<ol> <li>White gelatinous ppt not formed</li> <li>Dark green ppt is not formed</li> </ol>	2) May be $Fe^{+2}$
IV	Salt solution $+NH_4Cl + NH_4OH$ $NH_4OH + H_2S$ gas	1) White ppt is formed	1) May be $Zn^{+2}$

### Confirmatory test for Zn<sup>+2</sup> ion:

	S.No	Experiment		Observation	Inference
	1	1. Salt solution +NaOH sol	White Gela	tionous Ppt	$Zn^{+2}$ is confirmed
Re	<u>esult</u> :	1) Cation: Zn <sup>+2</sup>	<b>2</b> ) <b>Anion:</b> SO <sub>4</sub>	- <sup>2</sup> 3) S	alt: ZnSO <sub>4</sub>

### **IDETIFICATION OF FUNCTIONAL GROUP IN THE ORGANIC COMPOUNDS**

#### (04 - Marks)

#### <u>Aim</u>: Identify the functional group in the given organic compound

- <u>Physical State:</u> Crystalline solid Needle shaped Crystalline solid Straw colour liquid Pink colour liquid Colourless Liquid
- Glucose and Fructose.
- Benzonic acid
- Aniline
- Phenol
- Alcohols,Aldehyde,Ketones, Benzaldehyde and Acetic acid.

|--|

S.No	Experiment	Observation	Inference
1	A little amount of the	The compound burnt with a <b>non-sooty</b> flame.	It is an aliphatic
	compound is ignited in		Compound
	a spatula.	The compound burnt with a sooty flame	It is an aromatic
			compound

#### **III.**Solubility:

I.

	III. Dulu	<u>omey.</u>				
Solvent	In H <sub>2</sub> O	In NaOH	In HCl	In H <sub>2</sub> SO <sub>4</sub>	Soluble	
	Soluble	Soluble	In Soluble	In Soluble	aliphatic carboxylic acid	
	Soluble	In Soluble	In Soluble	In Soluble	Glucose,Fructose	
	Soluble	Soluble	Soluble	Soluble	Alcohols.	
	Soluble	In Soluble	In Soluble	In Soluble	Acetaldehyde,Ketones	
	In Soluble	In Soluble	In Soluble	Soluble	Aromatic aldehyde (Benzaldehyde)	
	Soluble	Soluble	In Soluble	Soluble	Aromatic carboxylic acid	
	In Soluble	Soluble	In Soluble	Soluble	Phenols	
	In Soluble	In Soluble	Soluble	Soluble.	Aromatic amines	

IV. Identification of functional group & Confirmatory tests:

# i) Test with Conc. H<sub>2</sub>SO<sub>4</sub>: (Carbohydrates ) S.No Experiment Observation Inference 1 Shake a small amount of the organic substance with few drops of Conc. H<sub>2</sub>SO<sub>4</sub> Charring in cold condition May be Glucose Molisch test:

	WIOIISCH LESU.		
S.No	Experiment	Observation	Inference
1	Molish test: To a small amount of	At the junction of the two	
	aqueous solution compound, few drops	liquids a deep violet colour	Carbohydrate is
	of alcoholic $\alpha$ - <b>naphhol</b> solution is	ring is obtained. This colour	present
	added. Then conc. $H_2SO_4$ is added	is discharged by adding alkali	
	down the side of the test tube carefully		

#### ii) <u>Test with NaHCO<sub>3</sub>:</u> (Carboxylic acids and Ethyl alcohol)

S.No	Experiment	Observation	Inference
1	Given organic compound	Effervescence taken placed	May be Aliphatic carboxylic
	+ 2ml NaHCO <sub>3</sub>	and CO <sub>2</sub> gas is liberated	acid/ Aromatic carboxylic acid
		Effervescences are not evolved	May be alcohol.

#### **Esterification test:**

S.No	Experiment	Observation	Inference
1	To few drops of the liquid taken in a	A fruity smell is	The compound is an aliphatic
	dry test tube, few drops of acetic	produced.	carboxylic acid
	<b>anhydride</b> and conc.H <sub>2</sub> SO <sub>4</sub> are added.		The compound is an aromatic
	The mixture is heated for two minutes. Then added to dilute $Na_2CO_3$ solution		carboxylic acid. The compound is an alcohol

S.No	Experiment	Observation	Inference
1	2 drops of organic compound	Voilet colour is produced	May be Aldehyde
	+2ml colourless Shiff's reagent		
		Voilet colour is not produced	May be Ketone
	<u>Test with 2,4 – DNP :</u>		
S.No	Experiment	Observation	Inference
1	To small amount of organic compound	Yellow (or)	Aliphatic / Aromatic
	2,4-DNP is added and shaken well	Red ppt is formed	aldehyde is present
			(or) Ketone is present

### iii) <u>Test with Schiff's reagent :</u>

### iv) <u>Test with Neutral FeCl<sub>3</sub> : (</u> Phenol )

S.No	Experiment	Observation	Inference
1	To a small amount of organic	Violet colour solution is	May be phenol
	compound (phenol) in water few drops	obtained	
	of neutral ferric chloride is added.		
	Libermann test :		

Experiment	Observation	Inference
To few drops of liquid compound Sodium nitrite is added . The mixture is warmed, shaken and cooled, to this mixture few drops of conc. $H_2SO_4$ is added and noured in cold water	A red solution is formed.	Phenol.
ť	<b>Experiment</b> To few drops of liquid compound Sodium nitrite is added . The mixture is warmed, shaken and cooled, to this mixture few drops of conc.H <sub>2</sub> SO <sub>4</sub> is added and poured in cold water.	ExperimentObservationTo few drops of liquid compound Sodium nitrite is added . The mixture is warmed, shaken and cooled, to this mixture few drops of conc.H2SO4 is added and poured in cold water.A red solution is formed.

#### v) <u>Diazonium test :</u> (Aniline):

S.No	Experiment	Observation	Inference
1	<b>Diazotization (Azo dye test):</b> Dissolve 5	A red colour azo dye is	May be it is
	drops of compound in Conc. HCl and 3ml	formed.	a primary
	of water.cool in ice and add few drops		Aromatic amine.
	20%NaNO <sub>2</sub> solution. Add the cold diazonium		
	solution to Acid solution of $\beta$ -Naphthol and		
	add 2ml of 10% NaOH solution.		
	Carbyl amine test:		

	<u>Carbyr annie test.</u>		
S.No	Experiment	Observation	Inference
1	<b>Isocyanide test:</b> To a small amount of the	Offensive (Unpleasent)	Primary amine is
	compound few drops of concentrated HCl and	smell of isocyanide	present
	few drops of chloroform (CHCl <sub>3</sub> )are added.	observed.	
	Add 10% alcoholic solution of potassium		
	hydroxide to the above mixture and warm.		
	Degult . The given compound is		

### **ACETIC ACID**

Identify the functional group in the given organic compound Aim: I.

**Physical State:** Colourless Liquid

Alcohols, Aldehyde, Ketones, Benzaldehyde and Acetic acid.

	II. <u> </u>	gnition test	<u> </u>					
S.No	Ex]	periment			Observati	0 <b>n</b>		Inference
1	A little amount of the compound is The compound but			rns with a	It	t is an aliphatic		
	ignited	in a spatula.		Composition composition com				Compound
	III.	<u>Solubility:</u>	BI		APPL			
Solve	nt In H <sub>2</sub> O	In NaOH		ĦĞĸĊ	In H <sub>2</sub> SO <sub>4</sub>		Sol	uble
	Soluble	Soluble	1 Sol	Sole	In Soluble	May I	be Car	boxylic acid
IV. Identification of functional group :								
	<u>Test w</u>	ith NaHCO	3 <u>:</u>					
S.No	Experi	ment		Observ	ation		Infe	rence
			- 22				· 1 /·	· · · · · · · · · · · · · · · · · · ·
1	Organic co	ompound	Efferve	escence	taken placed	May be A	liphati	c carboxylic acid
1	Organic co + 2ml Na	mpound HCO <sub>3</sub>	Efferve and C	escence O <sub>2</sub> gas	taken placed is liberated	May be A	liphati	c carboxylic acid
1	Organic co + 2ml Na <u>V. Conf</u>	ompound HCO <sub>3</sub>	Efferve and C t: Esterif	CO <sub>2</sub> gas	taken placed is liberated test:	May be A		
I S.No	Organic co + 2ml Na <u>V. Conf</u>	ompound HCO <sub>3</sub> irmatory test Expe	Efferve and C t: Esterif eriment	CO <sub>2</sub> gas	taken placed is liberated test:	Observation	on	Inference
1 <b>S.No</b> 1	Organic co + 2ml Na <u>V. Conf</u> To few drops	ompound HCO <sub>3</sub> irmatory test Expe	Efferve and C t: Esterif eriment taken in	a dry te	taken placed is liberated test: est tube,few	May be A Observation	on ll is	Inference The compound is
1 <b>S.No</b> 1	Organic co + 2ml Na <u>V. Conf</u> To few drops drops of Ethy	irmatory test Expe of the liquid alcohol ar	Efferve and C t: Esterif eriment taken in d Conc.l	$\frac{1}{2} \frac{1}{2} \frac{1}$	taken placed is liberated test: est tube,few are added.	May be A Observation A fruity sme produced	on Il is	Inference The compound is Aliphatic
1 <b>S.No</b> 1	Organic co + 2ml Na <u>V. Conf</u> To few drops drops of Ethy The mixture	ompound HCO <sub>3</sub> irmatory test Expe s of the liquid yl alcohol an is heated for t	Efferve and C t: Esterif eriment taken in d Conc.l	$CO_2$ gas fication a dry te $H_2SO_4$ tes. Th	taken placed is liberated test: est tube,few are added. en added to	May be A Observation A fruity sme produced	on Il is	Inference The compound is Aliphatic carboxylic acid

**<u>Result</u>**: The given compound is Aliphatic carboxylic acid.

### **2. ETHYL ALCOHOL**

Identify the functional group in the given organic compound <u>Aim</u>:

I. **Physical State:** Colourless Liquid

- Alcohols, Aldehyde, Ketones, Benzaldehyde and acetic acid.

		II. <u>I</u>	gnition test:	•	all's		•	
S.No	Experiment			The	Observatio	n	Inference	
1	A little amount of the compound is The compound burns with a					It is an aliphatic		
	ignited in a spatula.						Compound	
	III. Solubility:							
Solve	ent	In H <sub>2</sub> O	In NaQ	S'In HCl	In H <sub>2</sub> SO <sub>4</sub>	Solu	ıble	
		Soluble	Soluble	Soluble	Soluble	May be ald	cohols.	

IV. Identification of functional group:

i) Test with NaHCO<sub>3</sub>:

S.No	Experiment	Observation	Inference
1	Organic compound +	Effervescences are not evolved.	Carboxylic acids are absent
	2ml NaHCO <sub>3</sub>		May be alcohol.

### V. Confirmatory tests: Esterification test:

S.No	Experiment	Observation	Inference
1	To few drops of the liquid taken in a dry test tube, few drops of <b>acetic anhydride</b> and conc. $H_2SO_4$ are added.	A fruity smell is produced.	The compound is an alcohol
	The mixture is heated for two minutes. Then added to dilute $Na_2CO_3$ solution.		

**<u>Result</u>** : The given compound is <u>alcohol.</u>

### 3. BEZOIC ACID

Aim: Identify the functional group in the given organic compound

I. <u>Physical State:</u> Needle shaped crystalline solid - Benzoic acid.

	II. <u>Ign</u>	ntion test:				
S.No	Experiment			Abservation		Inference
1	A little amount of	of the compou	und is	e compound bu	rns with a	It is an aromatic
	ignited in	a spatula.	AVIO	sooty flam	ne.	Compound
	III.	<u>Solubility:</u>	BIN R A	Profile		
Solve	nt In H <sub>2</sub> O	In NaOH	Min Ber	In H <sub>2</sub> SO <sub>4</sub>	S	oluble
	Soluble S	Soluble 🌱	InSoluble	Soluble	May be aromat	ic carboxylic acid
	IV. Iden	tification of	f functional	group :		
	Test with	<u>n NaHCO3:</u>				
S.No	No Experiment Observation				Inference	
5.110	Experime	-110	Obse		11	
1	Organic com	pound	Effervescenc	e taken placed	May be arom	atic carboxylic acid
1	Organic com + 2ml NaHO	pound CO <sub>3</sub>	Effervescence and CO <sub>2</sub> ga	e taken placed as is liberated	May be arom	atic carboxylic acid
1	Organic com + 2ml NaHO	pound CO <sub>3</sub> natory test:	Effervescence and CO <sub>2</sub> ga Esterification	te taken placed as is liberated	May be arom	atic carboxylic acid
1 S.No	Organic com + 2ml NaHO <u>V. Confirm</u>	pound CO <sub>3</sub> natory test: Experi	Effervescence and CO <sub>2</sub> ga Esterification iment	te taken placed as is liberated	May be arom Observation	atic carboxylic acid Inference
1 <b>S.No</b> 1	Organic com + 2ml NaHO <u>V. Confirm</u> To few drops of	pound CO <sub>3</sub> natory test: Experi the liquid tal	Effervescence and CO <sub>2</sub> ga Esterification iment ken in a dry to	e taken placed as is liberated on test: est tube, few	May be arom       Observation       A fruity smell is	atic carboxylic acid         Inference         The compound is
1 <b>S.No</b> 1	Organic com + 2ml NaHO <u>V. Confirm</u> To few drops of drops of Ethyl al	pound CO <sub>3</sub> natory test: Experi the liquid tal lcohol and	Effervescence and CO <sub>2</sub> ga Esterification iment ken in a dry to Conc . H <sub>2</sub> SC	e taken placed as is liberated on test: est tube, few $0_4$ are added.	May be arom.         Observation         A fruity smell is produced.	Inference The compound is Aromatic
1 <b>S.No</b> 1	Organic com + 2ml NaHO <u>V. Confirm</u> To few drops of drops of Ethyl al The mixture is h	pound CO <sub>3</sub> natory test: Experi the liquid tal lcohol and eated for two	Effervescence and CO <sub>2</sub> ga Esterification iment ken in a dry to Conc . H <sub>2</sub> SC o minutes. Th	e taken placed as is liberated on test: est tube, few $P_4$ are added. en added to	May be arom         Observation         A fruity smell is produced.	Inference The compound is Aromatic carboxylic acid

Result : The given compound is Aromatic carboxylic acid.

### ACETALDEHYDE

### Aim:Identify the functional group in the given organic compoundI.Physical State:Colourless Liquid-Alcohols, A

Alcohols, Aldehyde, Ketones, Benzaldehyde and Acetic acid.

		II. <u>I</u>	<u>gnition test:</u>	-					
S.No	Experiment				Observatio	n		Inference	
1	A little amount of the compound is ignited in a spatula.			The compound burns with a non-sooty flame.		I	t is an aliphatic Compound		
	III. Solubility:								
Solve	ent	In H <sub>2</sub> O	In NaOH	In H	ICl	In H <sub>2</sub> SOF		Sol	uble
		In Soluble	In Soluble	In Sol	uble	n Soluble	May be ali	phati	ic compound
		IV. Ide	entification of	functi	ona	roup			
		Test wit	h Schiff's rea	agent :(	BING	BARCE			
S.No		Exp	periment	å		Observatio	<b>Observation</b> Ir		Inference
1	2	drops of orga	nic compound	12	Val	Vallet colour is produced Ma		Ma	y be aliphatic
	+2ml colourless Shiff's reagent				_		alde	ehydes	
	1	V. Confirmat	tory test: Test	with 2	,4 – D	NP :			
S.No		Experiment				Obser	vation		Inference
1	То	small amount	of organic co	mpound	1	Yellow (or) Re	ed ppt is form	ed	It is an Aldehyde
	2,4-	DNP is add	ed and shaken	well					

### **<u>Result</u>** : The given compound is <u>Aliphatic aldehyde.</u>

### **5. GLUCOSE**

#### Identify the functional group in the given organic compound <u>Aim</u>:

**Physical State:** Crystalline solid - Glucose, Fructose and Benzoic I.

	II. <u>Ignition test:</u>		
S.No	Experiment	Observation	Inference
1	A little amount of the compound is ignited in a spatula.	The compound burns with a non-sooty flame.	It is an aliphatic Compound

<u></u>	Solubil	<u>ity:</u>					
Solvent	In H <sub>2</sub> O	In NaOH	In HCl	In H <sub>2</sub> SO <sub>4</sub>	Soluble		
	Soluble	In Soluble	In Soluble	In Soluble	Glucose, Fructose		
IV	IV Identification of functional group:						

	<u>rv: Identification of functional group :</u>	
	ii) <u>Test with Conc. H<sub>2</sub>SO<sub>4</sub>: (Carbohydrates) (Action Conc. H<sub>2</sub>SO<sub>4</sub>:</u>	
S.No	Experiment Observation	Inference
1	Shake a small amount of the organic	May be
	substance with few drops of Conc.H <sub>2</sub> SO <sub>4</sub> O <sup>2</sup> with a smell of burnt sugar	Glucose
	We der	

	V. Confirmatory test:		
S.No	Experiment	Observation	Inference
1	Mollish test: To a small amount of aqueous	At the junction of the two	It is a
	solution compound, few drops of alcoholic	liquids a deep voilet colour	Carbohydrate
	$\alpha$ - <b>naphhol</b> solution is added. Then conc.	ring is obtained. This colour	
	$H_2SO_4$ is added down the side of the test	is discharged by adding alkali	
	tube carefully.		

<u>**Result</u>**: The given compound is *Glucose*.</u>

### <u>6. FRUCTOSE</u> Identify the functional group in the give corganic compound <u>Aim</u>:

	I. <u>Physical State:</u> The offstelline sol II. <u>Ignition test:</u>	lid - Glucose, Fructose and Benzoic	acid
S.No	Experiment Ob	oservation Inference	
1	A little amount of the compounds The compour non-sooty fl	nd burns with a It is an aliphatic lame. Compound	

	<u>III.</u>	Solubili	ty:				
Solvent		In H <sub>2</sub> O	In NaOH	In HCl		In H <sub>2</sub> SO <sub>4</sub>	Soluble
		Soluble	In Soluble	In Soluble		In Soluble	Glucose, Fructose
IV.	Ide	entification	of functional	<u>group :</u> i) <u>1</u>	<b>Fest with</b>	Conc. H <sub>2</sub> SO <sub>4</sub> :	Carbohydrates )
S.No	Experiment				0	bservation	Inference
1	Shake a small amount of the organic substance with few drops of Conc.H <sub>2</sub> SO <sub>4</sub>			Charrin with a sn	g upon heat nell of burnt sugar	May be Fructose	

V. Confirmatory test:

acid

S.No	Experiment	Observation	Inference
1	Mollish test: To a small amount of	At the junction of the two	It is a
	aqueous solution compound, few drops of	liquids a deep voilet colour	Carbohydrate
	alcoholic $\alpha$ - <b>naphhol</b> solution is added.	ring is obtained. This colour	
	Then conc. $H_2SO_4$ is added down the side	is discharged by adding alkali	
	of the test tube carefully		

<u>**Result</u>** : The given compound is *Fructose* .</u>

### 7. PHENOL

#### Aim: Identify the functional group in the given organic compound

I.	Physical State:	Pink colour liquid	- May be Phenol
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	II. <u>Ignition test:</u>		
S.No	Experiment	Observation	Inference
1	A little amount of the compound is ignited in a spatula.	The compound burns with a sooty flame.	May be aromatic compound
	III Solubility:		

	<u>111.</u>	<u>Solubility.</u>						
Solvent In H <sub>2</sub> O In NaOH		In HCl	In H <sub>2</sub> SO <sub>4</sub>	Soluble				
	In Soluble	Soluble	In Soluble	Soluble	May be aromatic compound			
IV II. the stift of free stift and second Test with Newtool FeCl								

IV. Identification of functional group: Test with Neutral Fev	IV.	<b>Identification of functional group:</b>	Test with	Neutral	FeCl <sub>3</sub>
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S.No	Experiment	Observation	Inference
1	To a small amount of organic compound (phenol) in water few drops of neutral ferric chloride is added .	Violet colour solution is obtained	May be phenol

#### V. Confirmatory test: Libermann test :

S.No	Experiment	Observation	Inference
1	To few drops of liquid compound	A red solution is	Phenol.
	Sodium nitrite is added . The mixture is warmed, shaken	formed.	
	and cooled, to this mixture few drops of $conc.H_2SO_4$ is		
	added and poured in cold water.		

Result: The given compound is Phenol .

### 8. ANILINE

#### Identify the functional group in the given organic compound Aim:

I. <u>Physical State:</u> Straw colour liquid - May be aniline

	II. <u>Ignition test:</u> -		
S.No	Experiment	Observation	Inference
1	A little amount of the compound is ignited in a spatula.	The compound burns with a sooty flame.	May be aromatic compound
	III Solubility	A	

	<u>III.</u> <u>50</u>	<u>iupinty.</u>							
Solvent/	In H <sub>2</sub> O	In NaOH		G In H <sub>2</sub> SO <sub>4</sub>	Soluble				
	In Soluble	In Soluble	Solublet	white precipitate	May be basic substances like				
			Bhar CO	excess of acid	aromatic amines.				
W Identification of function Discontinum test :									

	<u>Itentification of functional soup:</u> Diazonium	test :	
S.No	Experiments	Observation	Inference
1	<u>Azo dye test :</u> Dissolve 5 drops of compound in Conc.HCl and 3ml of water.cool in ice and add few drops 20%NaNO <sub>2</sub>	A red colour azo dye is formed.	May be it is a primary
	solution. Add the cold diazonium solution to Acid solution of $\beta$ -Naphthol and add 2ml of 10% NaOH solution.		Aromatic amine.

	V. Confirmatory test: Carbyl amine test :		
S.No	Experiment	Observation	Inference
1	<b>Isocyanide test:</b> To a small amount of the compound	Offensive	It is a primary
	few drops of concentrated HCl and few drops of	(Unpleasant)	amine.
	chloroform (CHCl <sub>3</sub> ) are added. Add 10% alcoholic	smell of isocyanides	
	solution of potassium hydroxide to the above mixture	Observed.	
	and warm.		
	Degulte The given compound is Arometic emine (A	niline)	

**<u>Result</u>:** The given compound is <u>Aromatic amine (Aniline)</u>.

### **BENZALDEHYDE**

Aim: Identify the functional group in the given organic compound I.

**Physical State:** Colourless Liquid Alcohols, Aldehyde, Ketones, -

Benzaldehyde and Acetic acid.

		II. <u>I</u>	<u>gnition test:</u>	-						
S.No	No Experiment			Observation			Inference			
1	Α	little amount	of the compou	nd is	The	compound bur	ms with a		May be aromatic	
		ignited	in a spatula.			sooty flam	e.		compound	
		III.	Solubility:		(a)	L CEST	·			
Solve	ent	In H <sub>2</sub> O	In NaOH	In	HCM	f H <sub>2</sub> SO <sub>4</sub>		Sol	uble	
		In Soluble	In Soluble	In S	luble C	Soluble	May be	arom	atic compound	
		<u>IV.</u> 1	<b>Identification</b>	of funç	Gonal	roup:				
		<u>Test wit</u>	th Schiff's reag	gent?	GN W					
S.No		Exp	periment	Ŋ	Observation			Inference		
1	2	drops of orga	nic compound		Viole	Violet colour is produced N		May	May be aromatic	
	+2	ml colourless	s Schiff's reage	ent				com	pound	
V. Confirmatory test: Test with 2,4 – DNP :										
S.No	S.No Experiment				Observation			Inference		
1	To small amount of organic compou			und	Yellow (or) R	ed ppt is form	ned	It is an aromatic		
	2	,4-DNP is a	dded and shake	en well					compound	

<u>Result</u>: The given compound is <u>Aromatic aldehyde (Benzaldehyde)</u>.

#### 10. ACETONE

#### Identify the functional group in the given organic compound Aim:

**<u>Physical State:</u>** Colourless Liquid I. -

Alcohols, Aldehyde, Ketones, Benzaldehyde and Acetic acid.

		II. <u>I</u>	<u>gnition</u> test:	-						
S.No	Experiment				Observatio	n		Inference		
1	A little amount of the compound is T			The	compound bur	ns with a		It is an aliphatic		
	ignited in a spatula.				non-sooty fla	me.		Compound		
	III. Solubility:									
Solve	Solvent In H <sub>2</sub> O In NaOH In HCl			HCl	In H <sub>2</sub> SO <sub>4</sub>	Soluble				
		In Soluble	In Soluble	In So	oluble In Solutile May be alip			liphatic compound		
	IV. Identification of functional adoup									
		Test wit	h Schiff's rea	agent :	Will's	Oferent				
S.No		Exp	periment	Ó	M <sup>a</sup> C	C Observation Inf		Inference		
1	2	drops of orga	nic compound	. (	OV of	tet colour is not produced M		Ma	ay be Ketone	
	+2ml colourless Shiff's reagent			SUM		1		5		
	V. Confirmatory test: Test with 2,4 – DNP :									
S.No		E	xperiment			Observation			Inference	
1	То	small amount	of organic con	mpoun	d	Yellow (or) Re	ed ppt is form	ed	It is a Ketone	
	2,4-	DNP is add	ed and shaken	well						

**<u>Result</u>** : The given compound is <u>Aliphatic Ketone.</u>

### Inter Mediate Practical Scheme of Valuation (30 Marks) (3Hours)

I.	QUALITATIVE ANALYSIS			10	10 MARKS		
	1.	Preliminary exa	minations	$\frac{1}{2}$ x 4 = 2			
	2.	Anions		1 + 1 + 1 + 1 = 4			
	3.	Cation		2 + 1 = 3			
	4.	Correct report		1			
II.	VOL	UMETRIC ANA	ALYSIS			11 MARKS	
	1.	Producer in the	first 10 Minutes. Wit	h equation		2 + 1 = 3	
	2.	Tabular form	(up to 1% error)			5	
		(b/w 1% to 2	2% error 4 Marks &	above 2% error 2	Marks)		
	3.	For indicating	the formula			1	
	4.	For calculation				2	
III.	Ide	ntification of fur	nctional group		04 MA	RKS.	
	1.	Physical state :	Solid / Liquid		¹∕₂ Mark		
	2.	Ignition Test:	Sooty flame – Aro	omatic	¹∕₂ Mark		
			Non sooty flame	– Aliphatic			
	3.	Solubility	1) In water 2)	In NaOH	1 Mark		

3) In HCl 4) Conc.  $H_2SO_4$ 

4.	Identification test for Functional Group	5.	Confirmation tests				
	1 Mark		1 Mark				
	1. Acetic acid: Test with NaHCO <sub>3</sub> – Effervescence		Esterification Test				
	2. Ethyl alcohol: Test with NaHCO <sub>3</sub> – No reaction		Esterification Test				
	3. Benzoic acid: Test with NaHCO <sub>3</sub> – Effervescence		Esterification Test				
	4. Acetaldehyde: Test with Schiff's reagent		Test with 2,4,DNP				
	5. Glucose : Test with Conc. $H_2SO_{4-}$		Molish Test				
	Charrinng in cold condition						
	6. Fructose: Test with Conc. H2SO4 –		Molish Test				
	Charrinng upon heat						
	7. Phenol: Test with neutral $FeCl_3$ in alcohol		Libermann Test				
	8 Aniline: Test with NaNO <sub>2</sub> , HCl and Phenol		Carbyl amine Test				
	9 Benzaldehyde: Test with Schiff's reagent		Test with 2,4,DNP				
	10 Acetone: Test with Schiff's reagent(No reaction)		Test with 2,4,DNP				
IV	IV. Viva voce 02 Marks						

V. Record 03 Marks