Systematic analysis of a (11 th) simple salt - Analysis of anion

Experiment No: Date:.....

S	Experiment	Observation	Inference		
1	Colour : Note the colour of the salt.	No characteristic colour	Absence of copper ,iron salt		
2	Action of heat: A small amount of a salt is strongly heated in a dry test tube.	A reddish brown gas is evolved	Presence of a nitrate salt		
3	Flame test: Take a small amount of salt in a watch glass. Add a drop of Conc. HCl to it and form a paste. Take the paste at the charred end of the splinter and introduce it near the Bunsen flame.	No characteristic colour flame is observed	Absence of copper ,barium and calcium salt		
4	Action of dil. HCI: Take a small amount of salt in a test tube and add about 1mL of dil. HCl to it. Gently heat it in the Bunsen flame	No characteristic change is observed	Absence of carbonate , sulphide		
5	Action of Conc.H ₂ SO ₄ : Take a small amount of a salt in a dry test tube, add about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame	Reddish brown gas turning acidified ferrous sulphate paper green evolves.	Presence of nitrate		
6	Action of MnO ₂ and Conc. H ₂ SO ₄ : Take a small amount of salt in a test tube, add pinch of MnO ₂ and about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame.	No characteristic colour gas is observed	Absence of chloride , bromide		
7	Action of Conc. H ₂ SO ₄ and copper turning: Take a small quantity of salt in a dry test tube and add few copper turnings and about 1mL of Conc. H ₂ SO ₄ . Gently heat it.	reddish brown gas with fishy odour turning a moist ferrous sulphate paper brown evolves .	Presence of nitrate		
8	Action of dil. NaOH solution: To a small quantity of a salt add about 1mL of dil. NaOH solution and gently heat it.	No characteristic colour gas is observed	Absence of Ammonium		
9 .	Chromyl chloride test: Take a small quantity of salt in a test tube, add a pinch of potassium di chromate and three drops Conc. H ₂ SO ₄ . Gently heat it. Pass the vapours to enter another test tube containing about 0.5 mL of sodium hydroxide. If a yellow solution is obtained, add about 1mL each of dil. acetic acid and lead acetate.	No yellow ppt is obtained	Absence of chloride		
	Analysis with sodium carbonate extract Preparation of sodium carbonate extract: Take 1 g of the given salt and 3 g of solid sodium carbonate in a 100 mL beaker. Add 20 g of distilled water then boiling the solution for few mins, filter collect the filtrate. The filtrate is called sodium carbonate extract.				
10.	Test for halides: one mL of the sodium carbonate extract add dil. HNO₃ in drops with shaking until the effervescence ceases, then add 1mL of AgNO₃, and shake it well.	No characteristic ppt is observed	Absence of chloride , bromide , sulphide		

11	Test with barium chloride: To about one mL of the sodium carbonate extract, add dil. acetic acid in drops with shaking until the effervescence ceases, then add 1mL of barium chloride solution and shake it well.	· ·	Absence of sulphate
12	Test with lead acetate: To about 1 mL of the sodium carbonate extract, add 1 mL of dil acetic acid and heat it, until the effervescence ceases, and then add 1mL of lead acetate.	No white ppt is observed	Absence of sulphate
13	Brown ring test: To about 1 mL o f the sodium carbonate extract add dil. H ₂ SO ₄ in drops with shaking until the effervescence ceases and about 0.5 mL of freshly prepared ferrous sulphate solution. Then keeping the test tube in a slanting position add Conc. H ₂ SO ₄ along the sides of the test tube.	A brown ring is formed	Presence of nitrate
14	Ammonium molybdate test: To one portion of the extract, add dil HNO ₃ until the effervescence ceases, then add about 1mL each of ammonium molybdate and Conc. HNO ₃ .		Absence of phosphate
15	Test with sodium nitro bruside: To about 1mL of the sodium carbonate extract add 1 mL of dil .aommonia. Then add about few drops of sodium nitro prusside.	No purple colouration appears	Absence of sulphide

Preparation of simple salt solution for the analysis of cations:

To a small amount of salt in a test tube add 2 to 3 m L of water, shake it and gently heat it. A clear solution is obtained. This solution is called "original salt solution".

16.	Group zero: To about 1 mL of the original salt solution add about 1mL each of Nessler's reagent and NaOH.	No chocolate brown ppt is obtained	Absence of zero group (ammonium.)		
17.	Group 1: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it	A white ppt is observed	Presence of 1 st group (Lead)		
	Analysis of the 1 st group ppt:				
18.	To the ppt add 1 mL of water and boil it	The ppt dissolves	Presence of lead		
19.	Test for Lead: i.) To one portion of the hot solution add about 1 mL of K ₂ CrO ₄ ii.) To an another portion of the hot solution add about 1 mL of KI. To the yellow ppt add about 1mL of water, boil and cool	A yellow ppt is obtained A yellow ppt is obtained. The yellow ppt dissolves on boiling, and on cooling golden spangles appear.	Presence of lead		

RESUL	т.
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The anion present : **NITRATE**The cation present : **LEAD**

The given simple salt : **LEAD NITRATE**

Systematic analysis of a (11 th) simple salt - Analysis of anion

S.	Experiment	Observation	Inference
1.	Colour : Note the colour of the salt.	Blue colour	Presence of copper salt
2.	Action of heat: A small amount of a salt is strongly heated in a dry test tube.	No characteristic colour gas is evolved	Absence of ammonium , nitrate , zinc salt
3.	Flame test: Take a small amount of salt in a watch glass. Add a drop of Conc. HCl to it and form a paste. Take the paste at the charred end of the splinter and introduce it near the Bunsen flame.	Bluish green flame	Presence of a copper salt
4.	Action of dil. HCI: Take a small amount of salt in a test tube and add about 1mL of dil. HCl to it. Gently heat it in the Bunsen flame.	No characteristic change is observed	Absence of carbonate , sulphide
5.	Action of Conc.H ₂ SO ₄ : Take a small amount of a salt in a dry test tube, add about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame	No characteristic colour gas is evolved	Absence of chloride , bromide , nitrate
6.	Action of MnO ₂ and Conc. H ₂ SO ₄ : Take a small amount of salt in a test tube, add pinch of MnO ₂ and about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame.	No characteristic colour gas is observed	Absence of chloride , bromide
7.	Action of Conc. H ₂ SO ₄ and copper turning: Take a small quantity of salt in a dry test tube and add few copper turnings and about 1mL of Conc. H ₂ SO ₄ .Gently heat it.	No characteristic colour gas is observed	Abesence of nitrate
8.	Action of dil. NaOH solution: To a small quantity of a salt add about 1mL of dil. NaOH solution and gently heat it.	No characteristic colour gas is observed	Absence of Ammonium
9.	Chromyl chloride test: Take a small quantity of salt in a test tube, add a pinch of potassium di chromate and three drops Conc. H ₂ SO ₄ . Gently heat it. Pass the vapours to enter another test tube containing about 0.5 mL of sodium hydroxide. If a yellow solution is obtained, add about 1mL each of dil. acetic acid and lead acetate.	No yellow ppt is obtained	Absence of chloride

	Analysis with sodium carbonate extract			
Prep	Preparation of sodium carbonate extract: Take 1 g of the given salt and 3 g of solid sodium carbonate in a 100 mL beaker. Add 20 g of distilled water then			
hoilin	ig the solution for few mins, filter collect the filtra			
10.	Test for halides: To about one mL of the sodium carbonate extract add dil. HNO3 in drops with shaking until the effervescence ceases, and then add about 1mL of AgNO3, and shake it well.	No characteristic ppt is observed	Absence of chloride , bromide , sulphide	
11.	Test with barium chloride: To about one mL of the sodium carbonate extract, add dil. acetic acid in drops with shaking until the effervescence ceases, then add 1mL of barium chloride solution and shake it well.	A white ppt is formed insoluble in dil H ₂ SO ₄	Presence of sulphate	
12.	Test with lead acetate: To about 1 mL of the sodium carbonate extract, add 1 mL of dil acetic acid and heat it, until the effervescence ceases, and then add 1mL of lead acetate.	A whit ppt soluble in excess of ammonium acetate is formed	Presence of sulphate	
13.	Brown ring test: To about 1 mL of the sodium carbonate extract add dil. H ₂ SO ₄ in drops with shaking until the effervescence ceases and about 0.5 mL of freshly prepared ferrous sulphate solution. Then keeping the test tube in a slanting position add Conc. H ₂ SO ₄ along the sides of the test tube.	No brown ring is formed	Absence of nitrate	
14.	Ammonium molybdate test: To one portion of the extract, dil HNO3 until the effervescence ceases, then add 1mL each of ammonium molybdate and Con.HNO3.	No canary yellow ppt formed.	Absence of phosphate	
15.	Test with sodium nitro bruside: To about 1mL of the sodium carbonate extract add 1 mL of dil .aommonia. Then add about few drops of sodium nitro prusside.	No purple colouration appears	Absence of sulphide	

Preparation of simple salt solution for the analysis of cations:

To a small amount of salt in a test tube add 3 m L of water, shake it and gently heat it. A clear solution is obtained. This solution is called "original salt solution".

16.	Group zero: To about 1 mL of the original salt solution add about 1mL each of Nessler's reagent and NaOH.	No chocolate brown ppt is obtained	Absence of zero group (ammonium.)
17.	Group 1: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it	No white ppt is observed	Absence of 1 st group (Lead)

18.	Group 2: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it then pass H ₂ S gas.	Black ppt is observed	Presence of 2 nd group (copper)
	Analysis of the 2	2 nd group ppt:	
	To the ppt add about 1mL of dil HNO₃ and	d boil it.The ppt dissolves. Cool it.	
19.	i) To one portion of the solution add ammonium hydroxide	No ppt is obtained, but the solution is blue	Presence of copper
20.	ii) Test for copper:To the blue coloured solution add about 1mL each of acetic acid and potassium ferrocyanide	A red brown ppt is obtained	Presence of copper
RES	SULT: The anion present : SULPHATE The cation present : COPPER The given simple salt : COPPER SU	LPHATE	

Systematic analysis of a (11 th) simple salt - Analysis of anion

LX	periment No :	Date :	
S.	Experiment	Observation	Inference
1.	Colour : Note the colour of the salt.	Blue colour	Presence of copper salt
2.	Action of heat: A small amount of a salt is strongly heated in a dry test tube.	No characteristic colour gas is evolved	Absence of ammonium , nitrate , zinc salt
3.	Flame test: Take a small amount of salt in a watch glass. Add a drop of Conc. HCl to it and form a paste. Take the paste at the charred end of the splinter and introduce it near the Bunsen flame.	Bluish green flame	Presence of a copper salt
4.	Action of dil. HCI: Take a small amount of salt in a test tube and add about 1mL of dil. HCl to it. Gently heat it in the Bunsen flame.	Brisk effervescence is noted. colourless, odourless gas turning lime water milky evolves	Presence of carbonate
5.	Action of Conc.H ₂ SO ₄ : Take a small amount of a salt in a dry test tube, add about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame	No characteristic colour gas is evolved	Absence of chloride , bromide , nitrate
6.	Action of MnO ₂ and Conc. H ₂ SO ₄ : Take a small amount of salt in a test tube, add pinch of MnO ₂ and about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame.	No characteristic colour gas is observed	Absence of chloride , bromide

7.	Action of Conc. H ₂ SO ₄ and copper turning:		
7.	Take a small quantity of salt in a dry test tube	No characteristic colour gas is	Abesence of nitrate
	and add few copper turnings and about 1mL	observed	
	of Conc. H ₂ SO ₄ .Gently heat it.		
8.	Action of dil. NaOH solution:		Absence of Ammonium
0.	To a small quantity of a salt add about 1mL of	No characteristic colour gas is	
	dil. NaOH solution and gently heat it.	observed	
9.	Chromyl chloride test: Take a small quantity of salt in a test tube, add a pinch of potassium di chromate and three drops Conc. H ₂ SO ₄ . Gently heat it. Pass the vapours to enter another test tube containing about 0.5 mL of sodium hydroxide. If a yellow solution is	No yellow ppt is obtained	Absence of chloride
	obtained, add about 1mL each of dil. acetic acid and lead acetate.		
	Analysis with sodiu	im carbonate extract	
Prep	paration of sodium carbonate extract: Take 1	g of the given salt and 3 g of solid sodium	carbonate in a 100 mL
beak	ker. Add 20 g of distilled water then boiling the so	plution for few mins, filter collect the filtrate	. The filtrate is called
sodi	um carbonate extract.		
10.	Test for halides:		
10.	To about one mL of the sodium carbonate		Absence of chloride,
	extract add dil. HNO3 in drops with shaking	No characteristic ppt is observed	bromide, sulphide
	until the effervescence ceases, and then	()	
	add about 1mL of AgNO3, and shake it well.		
4.4	Test with barium chloride: To about one		
11.	mL of the sodium carbonate extract, add dil.	No white ppt is formed	Absence of sulphate
	acetic acid in drops with shaking until the	>0	
	effervescence ceases, then add 1mL of		
	barium chloride solution and shake it well .		
12.	Test with lead acetate:		
12.	To about 1 mL of the sodium carbonate	No white ppt is formed	Absence of sulphate
	extract, add 1 mL of dil acetic acid and heat		
	it , until the effervescence ceases, and then		
	add 1mL of lead acetate.		
13.	Brown ring test: To about 1 mL o f the sodium carbonate extract add dil. H ₂ SO ₄ in drops with shaking until the effervescence		
	ceases and about 0.5 mL of freshly prepared ferrous sulphate solution. Then keeping the test tube in a slanting position	No brown ring is formed	Absence of nitrate
	add Conc. H ₂ SO ₄ along the sides of the test tube.		
1.4	Ammonium molybdate test:		
14.	To one portion of the extract, add dil HNO ₃		Absence of phosphate
	until the effervescence ceases, then add	No canary yellow ppt formed.	
	about 1mL each of ammonium		
	molybdate and Conc. HNO ₃ .		
15	Test with sodium nitro bruside: To about		
15.	1mL of the sodium carbonate extract add 1		Absence of sulphide
	mL of dil .aommonia. Then add about few	No purple colouration appears	
	drops of sodium nitro prusside.		

Preparation of simple salt solution for the analysis of cations:

To a small amount of salt in a test tube add 3 m L of dil HCl, shake it and gently heat it. A clear solution is obtained. This solution is called "original salt solution".

Group Separation

16.	Group zero: To about 1 mL of the original salt solution add about 1mL each of Nessler's reagent and NaOH.	No chocolate brown ppt is obtained	Absence of zero group (ammonium.)
17.	Group 1: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it	No white ppt is observed	Absence of 1 st group (Lead)
18.	Group 2: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it then pass H ₂ S gas.	Black ppt is observed	Presence of 2 nd group (copper)
		he 2 nd group ppt:	_
	To the ppt add about 1mL of dil 1	INO₃ and boil it.The ppt dissolves. Cool it	<u>.</u>
19.	i) To one portion of the solution add ammonium hydroxide	No ppt is obtained, but the solution is blue	Presence of copper
20.	ii) Test for copper:To the blue coloured solution add about 1mL each of acetic acid and potassium ferrocyanide	A red brown ppt is obtained	Presence of copper

RESULT:

The anion present : CARBONATE
The cation present : COPPER

The given simple salt : COPPER CARBONATE

Systematic analysis of a (11 th) simple salt - Analysis of anion

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S.	Experiment	Observation	Inference
1.	Colour : Note the colour of the salt.	Brown colour	May be an iron salt
2.	Action of heat: A small amount of a salt is strongly heated in a dry test tube.	No characteristic colour gas is evolved	Absence of ammonium , nitrate , zinc salt
3.	Flame test: Take a small amount of salt in a watch glass. Add a drop of Conc. HCl to it and form a paste. Take the paste at the charred end of the splinter and introduce it near the Bunsen flame.	No characteristic colour gas ,Change is observed	Absence of copper ,barium and calcium salt
4.	Action of dil. HCI: Take a small amount of salt in a test tube and add about 1mL of dil. HCl to it. Gently heat it in the Bunsen flame.	No characteristic colour gas , is observed	Absence of carbonate , sulphide
5.	Action of Conc.H ₂ SO ₄ : Take a small amount of a salt in a dry test tube, add Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame	A colourless gas evolves. It gives a dense white fumes	Presence of chloride

	Action of MnO ₂ and Conc. H ₂ SO ₄ :		
6.	Take a small amount of salt in a test tube,	A greenish yellow gas turning	Presence of chloride
	add pinch of MnO ₂ and about 0.5mL of Conc.	starch iodide paper blue evolves	
	H ₂ SO ₄ and gently heat it in the Bunsen	ctaren realide paper state eventee	
	flame.		
	Action of Conc. H ₂ SO ₄ and copper		
7.	turning: Take a small quantity of salt in a dry	No characteristic colour gas is	Abesence of nitrate
	test tube and add few copper turnings and	observed	Abesence of filtrate
		observed	
	about 1mL of Conc. H ₂ SO ₄ .Gently heat it. Action of dil. NaOH solution:	•	Absence of Ammonium
8.		No obavostovistio solovy soo is	Absence of Ammonium
0.	To a small quantity of a salt add about 1mL	No characteristic colour gas is	
	of dil. NaOH solution and gently heat it.	observed	
9.	Chromyl chloride test: Take a small		
9.	quantity of salt in a test tube, add a pinch of		
	potassium di chromate and three drops		
	Conc. H ₂ SO ₄ . Gently heat it. Pass the	A yellow ppt is obtained	Presence of chloride.
	vapours to enter another test tube containing		
	about 0.5 mL of sodium hydroxide. If a		
	yellow solution is obtained, add about 1mL		
	each of dil. acetic acid and lead acetate.		
		ım carbonate extract	
Prepa	aration of sodium carbonate extract: Take		ım carbonate in a 100 mL
	er. Add 20 g of distilled water then boiling the so		
	m carbonate extract.		
	Test for halides : To about one mL of the		
10.	sodium carbonate extract add dil. HNO3 in	A curdy white precipitate(ppt) insoluble	Presence of chloride
	drops with shaking until the effervescence	in about 1mL of dil. Ammonia is formed	1 10001100 01 011101100
	ceases, and then add about 1mL of AgNO3,	in about this of all. Athinomia is formed	
	and shake it well.		
	Test with barium chloride: To about one		
11.	mL of the sodium carbonate extract, add dil.	No white ppt is formed	Absence of sulphate
	acetic acid in drops with shaking until the	No write ppt is formed	Absence of Sulphate
	effervescence ceases, then add 1mL of		
	barium chloride solution and shake it well .		
12.	Test with lead acetate: To about 1 mL of	No white mut is former-	Absonos of substants
	the sodium carbonate extract, add 1 mL of	No white ppt is formed	Absence of sulphate
	dil acetic acid and heat it , until the effer		
	vescence ceases, add 1mL of lead acetate.		
13.	Brown ring test: To about 1 mL o f the		
13.	sodium carbonate extract add dil. H ₂ SO ₄ in		
	drops with shaking until the effervescence		
	ceases and about 0.5 mL of freshly	No brown ring is formed	Absence of nitrate
	prepared ferrous sulphate solution. Then		
	keeping the test tube in a slanting position		
	add Conc. H ₂ SO ₄ along the sides of the test		
	tube.		
	Ammonium molybdate test:		
14.	To one portion of the extract, add dil HNO ₃		Absence of phosphate
	until the effervescence ceases, then add	No canary yellow ppt formed.	1 1 2 1 2 2 2 2
	about 1mL each of ammonium	, , , , , , , , , , , , , , , , , , ,	
	molybdate and Conc. HNO ₃ .		
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15. Test with sodium nitro bruside: To about 1mL of the sodium carbonate extract add 1 mL of dil .aommonia. Then add about few drops of sodium nitro prusside.		Absence of sulphide
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Preparation of simple salt solution for the analysis of cations:

To a small amount of salt in a test tube add 3 m L of water, shake it and gently heat it. A clear solution is obtained. This solution is called "original salt solution".

Group Separation

19	Group 3: To about 1mL of the salt solution add about 1mL each of NH ₄ Cl and NH ₄ OH and shake it well	A brown ppt is obtained	presence of 3 rd group Ferric metal ion
18.	Group 2: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it then pass H ₂ S gas.	No Black ppt is observed	Absence of 2 nd group (copper)
17.	Group 1: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it	No white ppt is observed	Absence of 1 st group (Lead)
16.	Group zero: To about 1 mL of the original salt solution add about 1mL each of Nessler's reagent and NaOH.	No chocolate brown ppt is obtained	Absence of zero group (ammonium.)

Analysis of the 3 rd group ppt:

20.	To the ppt add a pinch of sodium peroxide and boil it	A brown ppt is obtained	Presence of iron		
21.	i.) Test for iron :To one portion of the red ppt add about 1mL of dil HCl and boil it and then add about 1mL of potassium ferocyanide.	A blue ppt is obtained	Presence of iron		
22.	ii.) To an another portion of the ppt add about 1 mL of dil. HNO₃ boil it and then add about 1ml of KCNS	A blood red colouration is seen	Presence of iron		

RESULT:

The anion present : CHLORIDE The cation present : FERRIC

The given simple salt : FERRIC CHLORIDE

Systematic analysis of a (11 th) simple salt - Analysis of anion

Experiment No : Date :

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S.	Experiment	Observation	Inference		
1.	Colour : Note the colour of the salt.	colourless	Absence of copper,iron salt		
2.	Action of heat: A small amount of a salt is strongly heated in a dry test tube.	No characteristic colour gas is evolved	Absence of ammonium , nitrate , zinc salt		
3.	Flame test: Take a small amount of salt in a watch glass. Add a drop of Conc. HCl to it and form a paste. Take the paste at the charred end of the splinter and introduce it near the Bunsen flame.	No characteristic colour flame is observed	Absence of copper, barium ,calcium salt		
4.	Action of dil. HCI: Take a small amount of salt in a test tube and add about 1mL of dil. HCl to it. Gently heat it in the Bunsen flame.	No characteristic change is observed	Absence of carbonate , sulphide		
5.	Action of Conc.H ₂ SO ₄ : Take a small amount of a salt in a dry test tube, add about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame	No characteristic colour gas is evolved	Absence of chloride , bromide , nitrate		
6.	Action of MnO ₂ and Conc. H ₂ SO ₄ : Take a small amount of salt in a test tube, add pinch of MnO ₂ and about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame.	No characteristic colour gas is observed	Absence of chloride , bromide		
7.	Action of Conc. H ₂ SO ₄ and copper turning: Take a small quantity of salt in a dry test tube and add few copper turnings and about 1mL of Conc. H ₂ SO ₄ .Gently heat it.	No characteristic colour gas is observed	Abesence of nitrate		
8.	Action of dil. NaOH solution: To a small quantity of a salt add about 1mL of dil. NaOH solution and gently heat it.	No characteristic colour gas is observed	Absence of Ammonium		
9.	Chromyl chloride test: Take a small quantity of salt in a test tube, add a pinch of potassium di chromate and three drops Conc. H ₂ SO ₄ . Gently heat it. Pass the vapours to enter another test tube containing about 0.5 mL of sodium hydroxide. If a yellow solution is obtained, add about 1mL each of dil. acetic acid and lead acetate.	No yellow ppt is obtained	Absence of chloride		
	Analysis with sodiu	im carbonate extract	•		
Pre	paration of sodium carbonate extract:				
Take 1 g of the given salt and 3 g of solid sodium carbonate in a 100 mL beaker. Add 20 g of distilled w					
boili	boiling the solution for few mins, filter collect the filtrate . The filtrate is called sodium carbonate extract.				
10.	Test for halides: To about one mL of the sodium carbonate extract add dil. HNO3 in drops with shaking until the effervescence ceases, and then add about 1mL of AgNO3, and shake it well.	No characteristic ppt is observed	Absence of chloride , bromide , sulphide		

11.	Test with barium chloride: To about one mL of the sodium carbonate extract, add dil. acetic acid in drops with shaking until the effervescence ceases, then add 1mL of barium chloride solution and shake it well.	A white ppt is formed insoluble in dil H ₂ SO ₄	Presence of sulphate
12.	Test with lead acetate: To about 1 mL of the sodium carbonate extract, add 1 mL of dil acetic acid and heat it, until the effervescence ceases, and then add 1mL of lead acetate.	A whit ppt soluble in excess of ammonium acetate is formed	Presence of sulphate
13.	Brown ring test: To about 1 mL of the sodium carbonate extract add dil. H ₂ SO ₄ in drops with shaking until the effervescence ceases and about 0.5 mL of freshly prepared ferrous sulphate solution. Then keeping the test tube in a slanting position add Conc. H ₂ SO ₄ along the sides of the test tube.	No brown ring is formed	Absence of nitrate
14.	Ammonium molybdate test: To one portion of the extract, add dil HNO ₃ until the effervescence ceases, then add about 1mL each of ammonium molybdate and Conc. HNO ₃ .	No canary yellow ppt formed.	Absence of phosphate
15.	Test with sodium nitro bruside: To about 1mL of the sodium carbonate extract add 1 mL of dil .aommonia. Then add about few drops of sodium nitro prusside.	No purple colouration appears	Absence of sulphide

Preparation of simple salt solution for the analysis of cations:

To a small amount of salt in a test tube add 3 m L of water, shake it and gently heat it. A clear solution is obtained. This solution is called "original salt solution".

16.	Group zero :To about 1 mL of the original salt solution add about 1mL each of Nessler's reagent and NaOH.	No chocolate brown ppt is obtained	Absence of zero group (ammonium.)
17.	Group 1: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it	No white ppt is observed	Absence of 1 st group (Lead)
18.	Group 2: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it then pass H ₂ S gas.	No Black ppt is observed	Absence of 2 nd group (copper)
19	Group 3: To about 1mL of the salt solution add about 1mL each of NH ₄ Cl and NH ₄ OH and shake it well	gelatinous white ppt is observed	presence of 3 rd group Aluminium metal ion

	Analysis of the 3 rd group ppt:			
	To the ppt add a pinch of sodium peroxide		Presence of Aluminium	
20.	and boil it	A colourless solution is obtained		
21.	Test for Aluminium : To the colourless	A gelatinous white ppt is obtained	Presence of Aluminium	
	solution add dil.HCl and shake it.			
RES	SULT:			
	The anion present : SULPHATE			
	The cation present : ALUMINIUM			
	The given simple salt : ALUMINIUM SULPHATE			

Systematic analysis of a (11 th) simple salt - Analysis of anion

	periment t No :		ate:
S.	Experiment	Observation	Inference
1.	Colour : Note the colour of the salt.	No characteristic colour	Absence of copper ,iron salt
2.	Action of heat: A small amount of a salt is strongly heated in a dry test tube.	A reddish brown gas is evolved	Presence of a nitrate salt
3.	Flame test: Take a small amount of salt in a watch glass. Add a drop of Conc. HCl to it and form a paste. Take the paste at the charred end of the splinter and introduce it near the Bunsen flame.	No characteristic colour flame is observed	Absence of copper ,barium and calcium salt
4.	Action of dil. HCl: Take a small amount of salt in a test tube and add about 1mL of dil. HCl to it. Gently heat it in the Bunsen flame.	No characteristic change is observed	Absence of carbonate , sulphide
5.	Action of Conc.H ₂ SO ₄ : Take a small amount of a salt in a dry test tube, add about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame	Reddish brown gas turning acidified ferrous sulphate paper green evolves.	Presence of nitrate
6.	Action of MnO ₂ and Conc. H ₂ SO ₄ : Take a small amount of salt in a test tube, add pinch of MnO ₂ and about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame	No characteristic colour gas is observed	Absence of chloride , bromide
7.	Action of Conc. H ₂ SO ₄ and copper turning: Take a small quantity of salt in a dry test tube and add few copper turnings and about 1mL of Conc. H ₂ SO ₄ .Gently heat it.	reddish brown gas with fishy odour turning a moist ferrous sulphate paper brown evolves .	Presence of nitrate
8.	Action of dil. NaOH solution: To a small quantity of a salt add about 1mL of dil. NaOH solution and gently heat it.	No characteristic colour gas is observed	Absence of Ammonium
9.	Chromyl chloride test: Take a small quantity of salt in a test tube, add a pinch of potassium di chromate and three drops Conc. H ₂ SO ₄ . Gently heat it. Pass the vapours to enter another test tube containing about 0.5 mL of sodium hydroxide. If a yellow solution is obtained, add about 1mL each of dil. acetic acid and lead acetate.	No yellow ppt is obtained	Absence of chloride

	Analysis with sodium carbonate extract		
Prep	Preparation of sodium carbonate extract: Take 1 g of the given salt and 3 g of solid sodium carbonate in a 100 mL beaker. Add 20 g of distilled water then		
hoilin	rake it g of the given sait and 3 g of solid so ig the solution for few mins, filter collect the filtr		
DOIIII	Test for halides:		le extract.
10.	To about one mL of the sodium carbonate extract add dil. HNO ₃ in drops with shaking until the effervescence ceases, and then add about 1mL of AgNO ₃ , and shake it well.	No characteristic ppt is observed	Absence of chloride , bromide , sulphide
11.	Test with barium chloride: To about one mL of the sodium carbonate extract, add dil. acetic acid in drops with shaking until the effervescence ceases, then add 1mL of barium chloride solution and shake it well.	No white ppt is observed	Absence of sulphate
12.	Test with lead acetate: To about 1 mL of the sodium carbonate extract, add 1 mL of dil acetic acid and heat it, until the effervescence ceases, and then add 1mL of lead acetate.	No white ppt is observed	Absence of sulphate
13.	Brown ring test: To about 1 mL o f the sodium carbonate extract add dil. H ₂ SO ₄ in drops with shaking until the effervescence ceases and about 0.5 mL of freshly prepared ferrous sulphate solution. Then keeping the test tube in a slanting position add Conc. H ₂ SO ₄ along the sides of the test tube.	A brown ring is formed	Presence of nitrate
14.	Ammonium molybdate test: To oneportion of the extract, add dil HNO3 until the efferve cence ceases, then add about 1mL each of ammonium molybdate and Conc. HNO3.	No canary yellow ppt formed.	Absence of phosphate
15.	Test with sodium nitro bruside: To about 1mL of the sodium carbonate extract add 1 mL of dil .aommonia. Then add about few drops of sodium nitro prusside.	No purple colouration appears	Absence of sulphide

Preparation of simple salt solution for the analysis of cations:

To a small amount of salt in a test tube add 3 m L of water, shake it and gently heat it. A clear solution is obtained. This solution is called "original salt solution"

16.	Group zero: To about 1 mL of the original salt solution add about 1mL each of Nessler's reagent and NaOH.		Absence of zero group (ammonium.)
17.	Group 1: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it	No white ppt is observed	Absence of 1 st group (Lead)

18.	Group 2: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it then pass H ₂ S gas	No Black ppt is observed	Absence of 2 nd group (copper)			
19	Group 3: To about 1mL of the salt solution add about 1mL each of NH ₄ Cl and NH ₄ OH and shake it well	gelatinous white ppt is observed	presence of 3 rd group Aluminium metal ion			
	Analysis of	f the 3 rd group ppt:				
20.	To the ppt add a pinch of sodium peroxide and boil it	A colourless solution is obtained	Presence of Aluminium			
21.	Test for Aluminium: To the colourless solution add dil.HCl and shake it.	A gelatinous white ppt is obtained	Presence of Aluminium			
RES	RESULT:					
	The anion present : NITRATE The cation present : ALUMINIUM The given simple salt : ALUMINIUM NITRATE					

Systematic analysis of a (11 th) simple salt - Analysis of anion

S.	Experiment	Observation	Inference
1.	Colour : Note the colour of the salt.	colourless	Absence of copper,iron salt
2.	Action of heat: A small amount of a salt is strongly heated in a dry test tube.	Salt is yellow when hot and white when cold	May be a zinc salt
3.	Flame test: Take a small amount of salt in a watch glass. Add a drop of Conc. HCl to it and form a paste. Take the paste at the charred end of the splinter and introduce it near the Bunsen flame.	No characteristic colour flame is observed	Absence of copper, barium ,calcium salt
4.	Action of dil. HCl: Take a small amount of salt in a test tube and add about 1mL of dil. HCl to it. Gently heat it in the Bunsen flame.	No characteristic change is observed	Absence of carbonate , sulphide
5.	Action of Conc.H ₂ SO ₄ : Take a small amount of a salt in a dry test tube, add about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame	No characteristic colour gas is evolved	Absence of chloride , bromide , nitrate
6.	Action of MnO ₂ and Conc. H ₂ SO ₄ : Take a small amount of salt in a test tube, add pinch of MnO ₂ and about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame.	No characteristic colour gas is observed	Absence of chloride , bromide
7.	Action of Conc. H ₂ SO ₄ and copper turning: Take a small quantity of salt in a dry test tube and add few copper turnings and about 1mL of Conc. H ₂ SO ₄ .Gently heat it.	No characteristic colour gas is observed	Abesence of nitrate

	Action of dil. NaOH solution:		Absence of Ammonium
8.	To a small quantity of a salt add about 1mL of	No characteristic colour gas is	
	dil. NaOH solution and gently heat it.	observed	
	Chromyl chloride test: Take a small		
9.	quantity of salt in a test tube, add a pinch of		
	potassium di chromate and three drops Conc.		
	H ₂ SO ₄ . Gently heat it. Pass the vapours to	No yellow ppt is obtained	Absence of chloride
	enter another test tube containing about 0.5	ppt to obtained	7 10001100 01 011101100
	mL of sodium hydroxide. If a yellow solution is		
	obtained, add about 1mL each of dil. acetic		
	acid and lead acetate.		
		ım carbonate extract	
Pren	paration of sodium carbonate extract:		
	Take 1 g of the given salt and 3 g of solid so	dium carbonate in a 100 mL beaker. Add 2	20 a of distilled water then
boilir	ng the solution for few mins, filter collect the filtra		
	Test for halides:		
10.	To about one mL of the sodium carbonate		Absence of chloride,
	extract add dil. HNO3 in drops with shaking	No characteristic ppt is observed	bromide , sulphide
	until the effervescence ceases, and then	The characteristic ppt to excerted	Si omiao , oaipinao
	add about 1mL of AgNO3, and shake it well.		
	Test with barium chloride: To about one	~~	
11.	mL of the sodium carbonate extract, add dil.	A white ppt is formed insoluble in dil	Presence of sulphate
	acetic acid in drops with shaking until the	H ₂ SO ₄	
	effervescence ceases, then add 1mL of		
	barium chloride solution and shake it well .		
	Test with lead acetate:		
12.	To about 1 mL of the sodium carbonate	A whit ppt soluble in excess of	Presence of sulphate
	extract, add 1 mL of dil acetic acid and heat	ammonium acetate is formed	
	it , until the effervescence ceases, and then		
	add 1mL of lead acetate.		
	Brown ring test: To about 1 mL o f the	• (7)	
13.	sodium carbonate extract add dil. H ₂ SO ₄ in		
	drops with shaking until the effervescence		
	ceases and about 0.5 mL of freshly	No brown ring is formed	Absence of nitrate
	prepared ferrous sulphate solution. Then	and the same of th	
	keeping the test tube in a slanting position		
	add Conc. H ₂ SO ₄ along the sides of the test		
	tube.		
	Ammonium molybdate test:		
14.	To one portion of the extract, add dil HNO ₃		Absence of phosphate
	until the effervescence ceases, then add	No canary yellow ppt formed.	
	about 1mL each of ammonium	, , , , , , , , , , , , , , , , , , ,	
	molybdate and Conc. HNO ₃ .		
	Test with sodium nitro bruside:		
15.	To about 1mL of the sodium carbonate		Absence of sulphide
	extract add 1 mL of dil .aommonia. Then	No purple colouration appears	
	add about few drops of sodium	The beautiful and the second s	
	·		
	nitro prusside.		

The given simple salt :

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Preparation of simple salt solution for the analysis of cations:

To a small amount of salt in a test tube add 3 m L of water , shake it and gently heat it. A clear solution is obtained. This solution is called "original salt solution".

Group Separation Group zero: Absence of zero group 16. To about 1 mL of the original salt No chocolate brown ppt is obtained (ammonium.) solution add about 1mL each of Nessler's reagent and NaOH. Group 1: Take about 1 mL of the salt Absence of 1 st group 17. solution in a test tube Add about 1 mL of dil No white ppt is observed (Lead) HCl. and shake it 18. Group 2: Take about 1 mL of the salt Absence of 2 nd group solution in a test tube Add about 1 mL of dil No Black ppt is observed (copper) HCl, and shake it then pass H₂S gas. 19 **Group 3:** To about 1mL of the salt solution Absence of 3 rd group add about 1mL each of NH₄Cl and NH₄OH Aluminium metal ion No gelatinous white ppt is observed and shake it well. 20. **Group 4**: To about 1mL of the salt solution presence of 4 th add about 1mL each of NH₄Cl and NH₄OH group metal ion (Zn^{2+,)} dirty white ppt is obtained and pass (H₂S) gas Analysis of the 4 th group ppt: 20. To the ppt add dil HCl and boil it The ppt dissolves Presence of zinc 21. Test for zinc To the solution add about A clear solution is obtained Presence of zinc 1.5mL of dil. NaOH and boil it **RESULT:** The anion present : SULPHATE The cation present : ZINC

Systematic analysis of a (11 th) simple salt - Analysis of anion

ZINC SULPHATE

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S.	Experiment	Observation	Inference
1.	Colour : Note the colour of the salt.	colourless	Absence of copper,iron salt
2.	Action of heat: A small amount of a salt is strongly heated in a dry test tube.	Salt is yellow when hot and white when cold	May be a zinc salt
3.	Flame test: Take a small amount of salt in a watch glass. Add a drop of Conc. HCl to it and form a paste. Take the paste at the charred end of the splinter and introduce it near the Bunsen flame.		Absence of copper, barium ,calcium salt
4.	Action of dil. HCI: Take a small amount of salt in a test tube and add about 1mL of dil. HCl to it. Gently heat it in the Bunsen flame.	A colourless gas with a rotten egg smell turning a paper dipped in lead acetate shining black evolves	Presence of sulphide

	Action of Conc.H ₂ SO ₄ :		Absence of chloride,
5.	Take a small amount of a salt in a dry test	No characteristic colour gas is evolved	bromide , nitrate
	tube, add about 0.5mL of Conc. H ₂ SO ₄ and	_	
	gently heat it in the Bunsen flame		
	Action of MnO ₂ and Conc. H ₂ SO ₄ :		
6.	Take a small amount of salt in a test tube,	No characteristic colour gas is	Absence of chloride,
	add pinch of MnO ₂ and about 0.5mL of Conc.	observed	bromide
	H ₂ SO ₄ and gently heat it in the Bunsen flame.		
	Action of Conc. H ₂ SO ₄ and copper turning:		
7.	Take a small quantity of salt in a dry test tube	No characteristic colour gas is	Abesence of nitrate
	and add few copper turnings and about 1mL	observed	
	of Conc. H ₂ SO ₄ .Gently heat it.		
	Action of dil. NaOH solution:		Absence of Ammonium
8.	To a small quantity of a salt add about 1mL of	No characteristic colour gas is	
	dil. NaOH solution and gently heat it.	observed	
	Chromyl chloride test: Take a small		
9.	quantity of salt in a test tube, add a pinch of		
	potassium di chromate and three drops Conc.		
	H ₂ SO ₄ . Gently heat it. Pass the vapours to	No yellow ppt is obtained	Absence of chloride
	enter another test tube containing about 0.5	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
	mL of sodium hydroxide. If a yellow solution is		
	obtained, add about 1mL each of dil. acetic		
	acid and lead acetate.	¥/ F	

Analysis with sodium carbonate extract

Preparation of sodium carbonate extract:

Take 1 g of the given salt and 3 g of solid sodium carbonate in a 100 mL beaker. Add 20 g of distilled water then boiling the solution for few mins, filter collect the filtrate . The filtrate is called sodium carbonate extract.

10.	Test for halides: To about one mL of the sodium carbonate extract add dil. HNO3 in drops with shaking until the effervescence ceases, and then add about 1mL of AgNO3, and shake it well.	A black ppt is formed	Presence of sulphide
11.	Test with barium chloride: To about one mL of the sodium carbonate extract, add dil. acetic acid in drops with shaking until the effervescence ceases, then add 1mL of barium chloride solution and shake it well.	No white ppt is formed	Absence of sulphate
12.	Test with lead acetate: To about 1 mL of the sodium carbonate extract, add 1 mL of dil acetic acid and heat it, until the effervescence ceases, and then add 1mL of lead acetate.	No whit ppt is formed	Absence of sulphate
13.	Brown ring test: To about 1 mL o f the sodium carbonate extract add dil. H ₂ SO ₄ in drops with shaking until the effervescence ceases and about 0.5 mL of freshly prepared ferrous sulphate solution. Then keeping the test tube in a slanting position add Conc. H ₂ SO ₄ along the sides of the test tube.	No brown ring is formed	Absence of nitrate

14.	Ammonium molybdate test: To one portion of the extract, add dil HNO ₃ until the effervescence ceases, then add about 1mL each of ammonium molybdate and Conc. HNO ₃ .	No canary yellow ppt formed.	Absence of phosphate
15.	Test with sodium nitro bruside: To about 1mL of the sodium carbonate extract add 1 mL of dil .aommonia. Then add about few drops of sodium nitro prusside.	A purple colouration appears	Presence of sulphide

Preparation of simple salt solution for the analysis of cations:

To a small amount of salt in a test tube add 3 m L dil HCL , shake it and gently heat it. A clear solution is obtained. This solution is called "original salt solution".

	Group zero :		Absence of zero group		
16.	To about 1 mL of the original salt	No chocolate brown ppt is obtained	(ammonium.)		
	solution add about 1mL each of Nessler's	The chocolate brown ppt to obtained	(ammomann.)		
	reagent and NaOH.				
	Group 1: Take about 1 mL of the salt	1/7	Absence of 1 st group		
17.	solution in a test tube Add about 1 mL of dil	No white ppt is observed	(Lead)		
	HCI, and shake it	Tro write ppt to observed	(2000)		
18.	Group 2: Take about 1 mL of the salt		Absence of 2 nd group		
	solution in a test tube Add about 1 mL of dil	No Black ppt is observed	(copper)		
	HCl, and shake it then pass H ₂ S gas.	THO BIGOR PPT IS OBSOLVED	(ооррег)		
19	Group 3 : To about 1mL of the salt solution		Absence of 3 rd group		
	add about 1mL each of NH ₄ Cl and NH ₄ OH	No gelatinous white ppt is observed	Aluminium metal ion		
	and shake it well.	The gold in ode write ppt is esserved	7 darimiani inotarion		
20.	Group 4 : To about 1mL of the salt solution		presence of 4th		
	add about 1mL each of NH ₄ Cl and NH ₄ OH	dirty white ppt is obtained	group metal ion (Zn ^{2+,)}		
	and pass (H ₂ S) gas	prio ostanios	g. cpc (
	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -				
	Analysis of th	ne 4 th group ppt :			
	111111,525 01 01	o i in group pp			
20.	To the ppt add dil HCl and boil it	The ppt dissolves	Presence of zinc		
21.	Test for zinc To the solution add about	A clear solution is obtained	Presence of zinc		
	1.5mL of dil. NaOH and boil it				
RES	ULT:		<u> </u>		
	The anion present : SULPHIDE				
	The anion present : SULPHIDE				
	The anion present : SULPHIDE The cation present : ZINC				

Systematic analysis of a (11 th) simple salt - Analysis of anion

S.	Experiment	Observation	Inference
1.	Colour : Note the colour of the salt.	colourless	Absence of copper,iron salt
2.	Action of heat: A small amount of a salt is strongly heated in a dry test tube.	No characteristic colour gas is evolved	Absence of ammonium , nitrate , zinc salt
3.	Flame test: Take a small amount of salt in a watch glass. Add a drop of Conc. HCl to it and form a paste. Take the paste at the charred end of the splinter and introduce it near the Bunsen flame.	Brick red	Presence of a calcium salt
4.	Action of dil. HCI: Take a small amount of salt in a test tube and add about 1mL of dil. HCl to it. Gently heat it in the Bunsen flame.	Brisk effervescence is noted. colourless, odourless gas turning lime water milky evolves	Presence of carbonate
5.	Action of Conc.H ₂ SO ₄ : Take a small amount of a salt in a dry test tube, add about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame	No characteristic colour gas is evolved	Absence of chloride , bromide , nitrate
6.	Action of MnO ₂ and Conc. H ₂ SO ₄ : Take a small amount of salt in a test tube, add pinch of MnO ₂ and about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame.	No characteristic colour gas is observed	Absence of chloride , bromide
7.	Action of Conc. H ₂ SO ₄ and copper turning: Take a small quantity of salt in a dry test tube and add few copper turnings and about 1mL of Conc. H ₂ SO ₄ .Gently heat it.	No characteristic colour gas is observed	Abesence of nitrate
8.	Action of dil. NaOH solution: To a small quantity of a salt add about 1mL of dil. NaOH solution and gently heat it.	No characteristic colour gas is observed	Absence of Ammonium
9.	Chromyl chloride test: Take a small quantity of salt in a test tube, add a pinch of potassium di chromate and three drops Conc. H ₂ SO ₄ . Gently heat it. Pass the vapours to enter another test tube containing about 0.5 mL of sodium hydroxide. If a yellow solution is obtained, add about 1mL each of dil. acetic acid and lead acetate.	No yellow ppt is obtained	Absence of chloride
•			
10.	Test for halides: To about one mL of the sodium carbonate extract add dil. HNO3 in drops with shaking until the effervescence	No characteristic ppt is observed	Absence of chloride , bromide , sulphide

ceases, and then add about 1mL of AgNO3,

and shake it well.

11.	Test with barium chloride: To about one mL of the sodium carbonate extract, add dil. acetic acid in drops with shaking until the effervescence ceases, then add 1mL of barium chloride solution and shake it well.	No white ppt is formed	Absence of sulphate
12.	Test with lead acetate: To about 1 mL of the sodium carbonate extract, add 1 mL of dil acetic acid and heat it, until the effervescence ceases, and then add 1mL of lead acetate.	No white ppt is formed	Absence of sulphate
13.	Brown ring test: To about 1 mL o f the sodium carbonate extract add dil. H ₂ SO ₄ in drops with shaking until the effervescence ceases and about 0.5 mL of freshly prepared ferrous sulphate solution. Then keeping the test tube in a slanting position add Conc. H ₂ SO ₄ along the sides of the test tube.	No brown ring is formed	Absence of nitrate
14.	Ammonium molybdate test: To one portion of the extract, add dil HNO ₃ until the effervescence ceases, then add about 1mL each of ammonium molybdate and Conc. HNO ₃ .	No canary yellow ppt formed.	Absence of phosphate
15.	Test with sodium nitro bruside: To about 1mL of the sodium carbonate extract add 1 mL of dil .aommonia. Then add about few drops of sodium nitro prusside.	No purple colouration appears	Absence of sulphide

Preparation of simple salt solution for the analysis of cations:

To a small amount of salt in a test tube add 3 m L of dil HCl , shake it and gently heat it. A clear solution is obtained. This solution is called "original salt solution".

	Cloup Ocparation			
16.	Group zero To about 1 mL of the original salt solution add about 1mL each of Nessler's reagent and NaOH.	No chocolate brown ppt is obtained	Absence of zero group (ammonium.)	
17.	Group 1: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it	No white ppt is observed	Absence of 1 st group (Lead)	
18.	Group 2: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it then pass H ₂ S gas.	No Black ppt is observed	Absence of 2 nd group (copper)	
19	Group 3: To about 1mL of the salt solution add about 1mL each of NH ₄ Cl and NH ₄ OH and shake it well.	No gelatinous white ppt is observed	Absence of 3 rd group Aluminium metal ion	
20.	Group 4: To about 1mL of the salt solution add about 1mL each of NH ₄ Cl and NH ₄ OH and pass (H ₂ S) gas	No dirty white ppt is obtained	Absence of 4th group metal ion (Zn ^{2+,)}	
21	Group 5 : To salt solution add 1mL each ofNH₄Cl, NH₄OH and (NH₄)₂CO₃ and shake it well.	A white ppt is obtained	presence of 5 th group metal ions (Ba ²⁺ , Ca ²⁺)	

	Analysis of the 5 th group ppt:			
22.	To the ppt add about 1mL of dil. acetic			
	acid and gently heat it. The ppt dissolves.			
	Divide the solution into two portions.			
	i).To one portion add about 1mL of	No yellow ppt is obtained	Absence of barium	
	potassium chromate			
23.	ii). To an another portion add about 1mL of	A white ppt is obtained.		
	ammonium sulphate	Filter the ppt thenTransfer the Residue,	Presence of Calcium	
		Add a drop of Conc. HCl. Take the		
		residue introduce near the Bunsen		
		flame. A crimson red colour is seen.		
RES	ULT :			
	The anion present : CARBONATE			
	The cation present : CALCIUM			
	The given simple salt : CALCIUM CAR	RBONATE		

S.	Experiment	Observation	Inference
1.	Colour : Note the colour of the salt.	colourless	Absence of copper ,iron salt
2.	Action of heat: A small amount of a salt is strongly heated in a dry test tube.	No characteristic colour gas is evolved	Absence of ammonium, nitrate, zinc salt
3.	Flame test: Take a small amount of salt in a watch glass. Add a drop of Conc. HCl to it and form a paste. Take the paste at the charred end of the splinter and introduce it near the Bunsen flame.	Apple green	Presence of barium salt
4.	Action of dil. HCI:Take a small amount of salt in a test tube and add about 1mL of dil. HCl to it. Gently heat it in the Bunsen flame.	No characteristic colour gas , is observed	Absence of carbonate , sulphide
5.	Action of Conc.H ₂ SO ₄ : Take a small amount of a salt in a dry test tube, add about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame	A colourless gas evolves. Itgives a dense white fumes when a glass rod dipped in liquid ammonia is brought close to its mouth	Presence of chloride
6.	Action of MnO ₂ and Conc. H ₂ SO ₄ : Take a small amount of salt in a test tube, add pinch of MnO ₂ and about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame.	A greenish yellow gas turning starch iodide paper blue evolves	Presence of chloride
7.	Action of Conc. H ₂ SO ₄ and copper turning: Take a small quantity of salt in a dry test tube and add few copper turnings and about 1mL of Conc. H ₂ SO ₄ . Gently heat it.	No characteristic colour gas is observed	Abesence of nitrate
8.	Action of dil. NaOH solution: To a small quantity of a salt add about 1mL of dil. NaOH solution and gently heat it.	No characteristic colour gas is observed	Absence of Ammonium

9. Chromyl chloride test: Take a small quantity of salt in a test tube, add a pinch of potassium di chromate and three drops Conc. H ₂ SO ₄ . Gently heat it. Pass the vapours to enter another test tube containing about 0.5 mL of sodium hydroxide. If a yellow solution is obtained, add about 1mL each of dil. acetic acid and lead acetate.	A yellow ppt is obtained	Presence of chloride.
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Analysis with sodium carbonate extract

Preparation of sodium carbonate extract:

Take 1 g of the given salt and 3 g of solid sodium carbonate in a 100 mL beaker. Add 20 g of distilled water then boiling the solution for few mins, filter collect the filtrate. The filtrate is called sodium carbonate extract.

10.	Test for halides: To about one mL of the sodium carbonate extract add dil. HNO3 in drops with shaking until the effervescence ceases, and then add about 1mL of AgNO3, and shake it well.	A curdy white precipitate(ppt) insoluble in about 1mL of dil. Ammonia is formed	Presence of chloride
11.	Test with barium chloride: To about one mL of the sodium carbonate extract, add dil. acetic acid in drops with shaking until the effervescence ceases, then add 1mL of barium chloride solution and shake it well.	No white ppt is formed	Absence of sulphate
12.	Test with lead acetate: To about 1 mL of the sodium carbonate extract, add 1 mL of dil acetic acid and heat it, until the effervescence ceases, and then add 1mL of lead acetate.	No white ppt is formed	Absence of sulphate
13.	Brown ring test: To about 1 mL o f the sodium carbonate extract add dil. H ₂ SO ₄ in drops with shaking until the effervescence ceases and about 0.5 mL of freshly prepared ferrous sulphate solution. Then keeping the test tube in a slanting position add Conc. H ₂ SO ₄ along the sides of the test tube.	No brown ring is formed	Absence of nitrate
14.	Ammonium molybdate test: To one portion of the extract, add dil HNO3 until the effervescence ceases, then add about 1mL each of ammonium molybdate and Conc. HNO3	No canary yellow ppt formed.	Absence of phosphate
15.	Test with sodium nitro bruside: To about 1mL of the sodium carbonate extract add 1 mL of dil .aommonia. Then add about few drops of sodium nitro prusside.	No purple colouration appears	Absence of sulphide

Preparation of simple salt solution for the analysis of cations:

To a small amount of salt in a test tube add 3 m L of water, shake it and gently heat it. A clear solution is obtained. This solution is called "original salt solution".

Group Separation

16.	Group zero :		Absence of zero group
10.	To about 1 mL of the original salt	No chocolate brown ppt is obtained	(ammonium.)
	solution add about 1mL each of Nessler's		
	reagent and NaOH.		
	Group 1: Take about 1 mL of the salt		Absence of 1 st group
17.	solution in a test tube Add about 1 mL of dil	No white ppt is observed	(Lead)
	HCI, and shake it		
18.	Group 2: Take about 1 mL of the salt		Absence of 2 nd group
	solution in a test tube Add about 1 mL of dil	No Black ppt is observed	(copper)
	HCl, and shake it then pass H ₂ S gas.		
19	Group 3 : To about 1mL of the salt solution		Absence of 3 rd group
	add about 1mL each of NH ₄ Cl and NH ₄ OH	No gelatinous white ppt is observed	Aluminium metal ion
	and shake it well.		
20.	Group 4 : To about 1mL of the salt solution		Absence of 4th
	add about 1mL each of NH ₄ Cl and NH ₄ OH	No dirty white ppt is obtained	group metal ion (Zn ^{2+,)}
	and pass (H ₂ S) gas		
21	Group 5: To salt solution add 1mL each	A white ppt is obtained	presence of 5 th
	ofNH ₄ Cl, NH ₄ OH and (NH ₄) ₂ CO ₃ and shake		group metal ions
	it well.		(Ba ²⁺ , Ca ²⁺)
	Analysis of th	ne 5 th group ppt :	
22.	To the ppt add about 1mL of dil. acetic	A yellow ppt is obtained.	
	acid and gently heat it. The ppt dissolves.	Filter the ppt and transfer the residue,	
	Divide the solution into two portions	Add a drop of Conc. HCI Take a	Proconce of barium

ı				
	22.	To the ppt add about 1mL of dil. acetic acid and gently heat it. The ppt dissolves. Divide the solution into two portions. i).To one portion add about 1mL of potassium chromate	A yellow ppt is obtained. Filter the ppt and transfer the residue, Add a drop of Conc. HCl. Take a portion of the paste and introduce near the Bunsen flame. A transient green is imparted to the flame	Presence of barium
	23.	ii). To an another portion add about 1mL of ammonium sulphate	No white ppt is obtained.	Absence of Calcium

RESULT:

The anion present : CHLORIDE The cation present : BARIUM

The given simple salt : BARIUM CHLORIDE

Systematic analysis of a (11 th) simple salt - Analysis of anion

S.	Experiment	Observation	Inference
1.	Colour : Note the colour of the salt.	colourless	Absence of copper ,iron salt
2.	Action of heat: A small amount of a salt is strongly heated in a dry test tube.	No characteristic colour gas is evolved	Absence of ammonium , nitrate , zinc salt
3.	Flame test: Take a small amount of salt in a watch glass. Add a drop of Conc. HCl to it and form a paste. Take the paste at the charred end of the splinter and introduce it near the Bunsen flame.	No characteristic colour flame is observed	Absence of copper ,barium and calcium salts
4.	Action of dil. HCI:Take a small amount of salt in a test tube and add about 1mL of dil. HCl to it. Gently heat it in the Bunsen flame.	No characteristic change is observed	Absence of carbonate , sulphide
5.	Action of Conc.H ₂ SO ₄ : Take a small amount of a salt in a dry test tube, add about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame	No characteristic colour gas is evolved	Absence of chloride , bromide , nitrate
6.	Action of MnO ₂ and Conc. H ₂ SO ₄ : Take a small amount of salt in a test tube, add pinch of MnO ₂ and about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame.	No characteristic colour gas is observed	Absence of chloride , bromide
7.	Action of Conc. H ₂ SO ₄ and copper turning: Take a small quantity of salt in a dry test tube and add few copper turnings and about 1mL of Conc. H ₂ SO ₄ .Gently heat it.	No characteristic colour gas is observed	Abesence of nitrate
8.	Action of dil. NaOH solution: To a small quantity of a salt add about 1mL of dil. NaOH solution and gently heat it.	No characteristic colour gas is observed	Absence of Ammonium
9.	Chromyl chloride test: Take a small quantity of salt in a test tube, add a pinch of potassium di chromate and three drops Conc. H ₂ SO ₄ . Gently heat it. Pass the vapours to enter another test tube containing about 0.5 mL of sodium hydroxide. If a yellow solution is obtained, add about 1mL each of dil. acetic acid and lead acetate.	No yellow ppt is obtained	Absence of chloride
	Analysis with sodius paration of sodium carbonate extract: Take 1 g of the given salt and 3 g of solid so any the solution for few mins, filter collect the filtra		
10.	Test for halides: To about one mL of the sodium carbonate extract add dil. HNO3 in drops with shaking until the effervescence ceases, and then add about 1mL of AgNO3, and shake it well.	No characteristic ppt is observed	Absence of chloride , bromide , sulphide

11.	Test with barium chloride: To about one mL of the sodium carbonate extract, add dil. acetic acid in drops with shaking until the effervescence ceases, then add 1mL of barium chloride solution and shake it well.	A white ppt is formed insoluble in dil H ₂ SO ₄	Presence of sulphate
12.	Test with lead acetate: To about 1 mL of the sodium carbonate extract, add 1 mL of dil acetic acid and heat it, until the efferves cence ceases, and then add lead acetate.	A whit ppt soluble in excess of ammonium acetate is formed	Presence of sulphate
13.	Brown ring test: To about 1 mL of the sodium carbonate extract add dil. H ₂ SO ₄ in drops with shaking until the effervescence ceases and about 0.5 mL of freshly prepared ferrous sulphate solution. Then keeping the test tube in a slanting position add Conc. H ₂ SO ₄ along the sides of the test tube.	No brown ring is formed	Absence of nitrate
14.	Ammonium molybdate test: To one portion of the extract, add dil HNO ₃ until the effervescence ceases, then add about 1mL each of ammonium molybdate and Conc. HNO ₃ .	No canary yellow ppt formed.	Absence of phosphate
15.	Test with sodium nitro bruside: To about 1mL of the sodium carbonate extract add 1 mL of dil .aommonia. Then add about few drops of sodium nitro prusside.	No purple colouration appears	Absence of sulphide

Preparation of simple salt solution for the analysis of cations: To a small amount of salt in a test tube add 3 m L of water, shake it and gently heat it. A clear solution is obtained. This solution is called "original salt solution".

16.	Group zero :To about 1 mL of the original salt solution add about 1mL each of Nessler's reagent and NaOH.	No chocolate brown ppt is obtained	Absence of zero group (ammonium.)
17.	Group 1: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it	No white ppt is observed	Absence of 1 st group (Lead)
18.	Group 2: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it then pass H ₂ S gas.	No Black ppt is observed	Absence of 2 nd group (copper)
19	Group 3: To about 1mL of the salt solution add about 1mL each of NH ₄ Cl and NH ₄ OH and shake it well.	No gelatinous white ppt is observed	Absence of 3 rd group Aluminium metal ion
20.	Group 4 : To about 1mL of the salt solution add about 1mL each of NH ₄ Cl and NH ₄ OH and pass (H ₂ S) gas	No dirty white ppt is obtained	Absence of 4th group metal ion (Zn ^{2+,)}
21	Group 5 : To salt solution add 1mL each ofNH ₄ Cl, NH ₄ OH and (NH ₄) ₂ CO ₃ and shake it well.	No white ppt is obtained	Absence of 5 th group metal ions (Ba ²⁺ , Ca ²⁺)

22.	Group 6: To about 1mL of the original salt solution add about 1mL each of NH ₄ Cl, NH ₄ OH and NH ₄ H ₂ PO ₄ , and scratch the sides of the test tube.		Presence of Magnesium
	Analysis of th	ne 6 th group ppt :	
23.	To about 1mL of the original salt solution	A white ppt insoluble in excess of	Presence of
	add dil. NaOH in drops with shaking.	NaOH is formed	Magnesium
24.	To about 1mL of the original salt solution	A blue ppt is formed.	Presence of
	add about 1mL of Magneson reagent		Magnesium
RES	ULT :		
	The anion present : SULPHATE		
	The cation present : MAGNESIUM		
	The given simple salt : MAGNESIUM S	SULPHATE	

Systematic analysis of a (11 th) simple salt - Analysis of anion

	periment no :	Date :		
S.	Experiment	Observation	Inference	
1.	Colour : Note the colour of the salt.	colourless	Absence of copper,iron salt	
2.	Action of heat: A small amount of a salt is strongly heated in a dry test tube.	No characteristic colour gas is evolved	Absence of ammonium , nitrate , zinc salt	
3.	Flame test: Take a small amount of salt in a watch glass. Add a drop of Conc. HCl to it and form a paste. Take the paste at the charred end of the splinter and introduce it near the Bunsen flame.	No characteristic colour flame	Absence of copper, barium and calcium salts	
4.	Action of dil. HCI:Take a small amount of salt in a test tube and add about 1mL of dil. HCI to it. Gently heat it in the Bunsen flame.	Brisk effervescence is noted.colourless, odourless gas turning lime water milky evolves	Presence of carbonate	
5.	Action of Conc.H ₂ SO ₄ : Take a small amount of a salt in a dry test tube, add about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame	No characteristic colour gas is evolved	Absence of chloride , bromide , nitrate	
6.	Action of MnO ₂ and Conc. H ₂ SO ₄ : Take a small amount of salt in a test tube, add pinch of MnO ₂ and about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame.	No characteristic colour gas is observed	Absence of chloride , bromide	
7.	Action of Conc. H ₂ SO ₄ and copper turning: Take a small quantity of salt in a dry test tube and add few copper turnings and about 1mL of Conc. H ₂ SO ₄ .Gently heat it.	No characteristic colour gas is observed	Abesence of nitrate	

Absence of sulphide

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	Action of dil. NaOH solution:		Absence of Ammonium
3.	To a small quantity of a salt add about 1mL of	No characteristic colour gas is	
	dil. NaOH solution and gently heat it.	observed	
	Chromyl chloride test: Take a small		
).	quantity of salt in a test tube, add a pinch of		
	potassium di chromate and three drops Conc.		
	H ₂ SO ₄ . Gently heat it. Pass the vapours to	No yellow ppt is obtained	Absence of chloride
	enter another test tube containing about 0.5		
	mL of sodium hydroxide. If a yellow solution is		
	obtained, add about 1mL each of dil. acetic		
	acid and lead acetate.		
	Analysis with sodiι	ım carbonate extract	
	paration of sodium carbonate extract : Take		
	ker. Add 20 g of distilled water then boiling the	solution for few mins, filter collect the fil	trate . The filtrate is calle
iodi	um carbonate extract.		
	Test for halides:		
0.	To about one mL of the sodium carbonate		Absence of chloride
	extract add dil. HNO3 in drops with shaking	No characteristic ppt is observed	bromide , sulphide
	until the effervescence ceases, and then	The characteristic ppt is observed	brofflide , sulpflide
	add about 1mL of AgNO3, and shake it well.		
	Test with barium chloride: To about one		
1.	mL of the sodium carbonate extract, add dil.	No white ppt is formed	Absence of sulphate
	acetic acid in drops with shaking until the	The same parties and the same parties are sam	
	effervescence ceases, then add 1mL of		
	barium chloride solution and shake it well .		
	Test with lead acetate:		
2.	To about 1 mL of the sodium carbonate	No white ppt is formed	Absence of sulphate
	extract, add 1 mL of dil acetic acid and heat		
	it, until the effervescence ceases, and then		
	add 1mL of lead acetate.		
_	Brown ring test: To about 1 mL o f the		
3.	sodium carbonate extract add dil. H ₂ SO ₄ in		
	drops with shaking until the effervescence	7	
	ceases and about 0.5 mL of freshly	No brown ring is formed	Absence of nitrate
	prepared ferrous sulphate solution. Then		
	keeping the test tube in a slanting position		
	add Conc. H ₂ SO ₄ along the sides of the test		
	tube.		
1	Ammonium molybdate test:		
4.	To one portion of the extract, add dil HNO ₃		Absence of phosphate
	until the effervescence ceases, then add	No canary yellow ppt formed.	
	the factor of th	•	

Preparation of simple salt solution for the analysis of cations:

about 1mL each of ammonium molybdate and Conc. HNO₃.

drops of sodium nitro prusside.

15.

Test with sodium nitro bruside: To about

1mL of the sodium carbonate extract add 1

mL of dil .aommonia. Then add about few

To a small amount of salt in a test tube add 3 m L of dil HCl , shake it and gently heat it. A clear solution is obtained. This solution is called "original salt solution".

No purple colouration appears

16.	Group zero :To about 1 mL of the original salt solution add about 1mL each of Nessler's reagent and NaOH.	No chocolate brown ppt is obtained	Absence of zero group (ammonium.)
17.	Group 1: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it.	No white ppt is observed	Absence of 1 st group (Lead)
18.	Group 2: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it then pass H ₂ S gas.	No Black ppt is observed	Absence of 2 nd group (copper)
19	Group 3: To about 1mL of the salt solution add about 1mL each of NH ₄ Cl and NH ₄ OH and shake it well.	No gelatinous white ppt is observed	Absence of 3 rd group Aluminium metal ion
20.	Group 4: To about 1mL of the salt solution add about 1mL each of NH ₄ Cl and NH ₄ OH and pass (H ₂ S) gas	No dirty white ppt is obtained	Absence of 4th group metal ion (Zn ^{2+,)}
21	Group 5 : To salt solution add 1mL each ofNH₄Cl, NH₄OH and (NH₄)₂ CO₃ and shake it well.	No white ppt is obtained	Absence of 5 th group metal ions (Ba ²⁺ , Ca ²⁺)
22.	Group 6 : To about 1mL of the original salt solution add about 1mL each of NH ₄ Cl, NH ₄ OH and NH ₄ H ₂ PO ₄ , and scratch the sides of the test tube.	A white ppt is obtained	Presence of Magnesium
	Analysis of th	ne 6 th group ppt :	
23.	To about 1mL of the original salt solution add dil. NaOH in drops with shaking.	A white ppt insoluble in excess of NaOH is formed	Presence of Magnesium
24.	To about 1mL of the original salt solution add about 1mL of Magneson reagent	A blue ppt is formed.	Presence of Magnesium
RES	The anion present : CARBONATE The cation present : MAGNESIUM The given simple salt : MAGNESIUM C	CARBONATE	

Systematic analysis of a (11 th) simple salt - Analysis of anion

	periment No:	Date :	
S.	Experiment	Observation	Inference
1.	Colour : Note the colour of the salt.	colourless	Absence of copper,iron salt
2.	Action of heat: A small amount of a salt is strongly heated in a dry test tube.	No characteristic colour gas is evolved	Absence of ammonium , nitrate , zinc salt
3.	Flame test: Take a small amount of salt in a watch glass. Add a drop of Conc. HCl to it and form a paste. Take the paste at the charred end of the splinter and introduce it near the Bunsen flame.	No characteristic colour flame	Absence of copper, barium and calcium salts
4.	Action of dil. HCI: Take a small amount of salt in a test tube and add about 1mL of dil. HCI to it. Gently heat it in the Bunsen flame.	No Brisk effervescence is noted.	Absence of carbonate
5.	Action of Conc.H ₂ SO ₄ : Take a small amount of a salt in a dry test tube, add0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame	No characteristic colour gas is evolved	Absence of chloride , bromide , nitrate
6.	Action of MnO ₂ and Conc. H ₂ SO ₄ : Take a small amount of salt in a test tube, add pinch of MnO ₂ and about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame.	No characteristic colour gas is observed	Absence of chloride , bromide
7.	Action of Conc. H ₂ SO ₄ and copper turning: Take a small quantity of salt in a dry test tube and add few copper turnings and about 1mL of Conc. H ₂ SO ₄ .Gently heat it.	No characteristic colour gas is observed	Abesence of nitrate
8.	Action of dil. NaOH solution: To a small quantity of a salt add about 1mL of dil. NaOH solution and gently heat it.	No characteristic colour gas is observed	Absence of Ammonium
9.	Chromyl chloride test: Take a salt in a test tube, add a pinch of potassium di chromate and three drops Conc. H ₂ SO ₄ . Gently heat it. Pass the vapours to enter another test tube containing about 0.5 mL of sodium hydroxide. If a yellow solution is obtained, add about 1mL each of dil. acetic acid and lead acetate.	No yellow ppt is obtained	Absence of chloride
beal	Analysis with sodium carbonate extract: Take 1 ker. Add 20 g of distilled water then boiling the sound carbonate extract.		
10.	Test for halides: To about one mL of the sodium carbonate extract add dil. HNO3 in drops with shaking until the effervescence ceases, and then add about 1mL of AgNO3, and shake it well.	No characteristic ppt is observed	Absence of chloride , bromide , sulphide
11.	Test with barium chloride: To about one mL of the sodium carbonate extract, add dil. acetic acid in drops with shaking until the	No white ppt is formed	Absence of sulphate

effervescence ceases, then add 1mL of barium chloride solution and shake it well .

12.	Test with lead acetate: To about 1 mL the sodium carbonate extract, add dil acetic acid and heat it, until the effervescence ceases, and then add 1mL of lead acetate.	No white ppt is formed	Absence of sulphate
13.	Brown ring test: To about 1 mL o f the sodium carbonate extract add dil. H ₂ SO ₄ in drops with shaking until the effervescence ceases and about 0.5 ml of freshly prepared ferrous sulphate solution. Then add Conc. H ₂ SO ₄ along the sides of the tube.	No brown ring is formed	Absence of nitrate
14.	Ammonium molybdate test: To one portion of the extract, add dil HNO ₃ until the effervescence ceases, then add 1mL each of ammonium molybdate and Conc. HNO ₃ .	A canary yellow ppt formed.	Presence of phosphate
15.	Test with sodium nitro bruside: To about 1mL of the sodium carbonate extract add 1 mL of dil .aommonia. Then add about few drops of sodium nitro prusside.	No purple colouration appears	Absence of sulphide

Preparation of simple salt solution for the analysis of cations:

To a small amount of salt in a test tube add 3 m L of dil HCl , shake it and gently heat it. A clear solution is obtained. This solution is called "original salt solution.

	Group Separation				
16.	Group zero: To about 1 mL of the original salt solution add about 1 mL each of	No chocolate brown ppt is obtained	Absence of zero group (ammonium.)		
	Nessler's reagent and NaOH.				
17.	Group 1: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it	No white ppt is observed	Absence of 1 st group (Lead)		
18.	Group 2 : Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it then pass H ₂ S gas.	No Black ppt is observed	Absence of 2 nd group (copper)		
19	Group 3 : To about 1mL of the salt solution add about 1mL each of NH ₄ Cl and NH ₄ OH and shake it well.	No gelatinous white ppt is observed	Absence of 3 rd group Aluminium metal ion		
20.	Group 4: To about 1mL of the salt solution add about 1mL each of NH ₄ Cl and NH ₄ OH and pass (H ₂ S) gas	No dirty white ppt is obtained	Absence of 4th group metal ion (Zn ^{2+,)}		
21	Group 5 : To salt solution add 1mL each ofNH ₄ Cl, NH ₄ OH and (NH ₄) ₂ CO ₃ and shake it well.	No white ppt is obtained	Absence of 5 th group metal ions (Ba ²⁺ , Ca ²⁺)		
22.	Group 6 : To about 1mL of the original salt solution add about 1mL each of NH ₄ Cl, NH ₄ OH and NH ₄ H ₂ PO ₄ , and scratch the sides of the test tube.	A white ppt is obtained	Presence of Magnesium		
	Analysis of the 6 th group ppt:				
23.	To about 1mL of the original salt solution add dil. NaOH in drops with shaking.		Presence of Magnesium		
24.	To about 1mL of the original salt solution add about 1mL of Magneson reagent	A blue ppt is formed.	Presence of Magnesium		

RESULT:

The anion present : **PHOSPHATE**The cation present : **MAGNESIUM**

The given simple salt : MAGNESIUM PHOSPHATE

Systematic analysis of a (11 th) simple salt - Analysis of anion

S.	Experiment	Observation	Inference
1.	Colour : Note the colour of the salt.	colourless	Absence of copper ,iron salt
2.	Action of heat: A small amount of a salt is strongly heated in a dry test tube.	A colourless gas with the pungent smell, forming a dense white fumes when a glass rod dipped in Conc. HCl is brought close to its mouth	Presence of ammonium salt
3.	Flame test: Take a small amount of salt in a watch glass. Add a drop of Conc. HCl to it and form a paste. Take the paste at the charred end of the splinter and introduce it near the Bunsen flame.	No characteristic colour flame is observed	Absence of copper, barium and calcium salt
4.	Action of dil. HCI: Take a small amount of salt in a test tube and add about 1mL of dil. HCl to it. Gently heat it in the Bunsen flame.	No characteristic colour gas , is observed	Absence of carbonate , sulphide
5.	Action of Conc.H ₂ SO ₄ : Take a small amount of a salt in a dry test tube, add about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame	A colourless gas evolves. Itgives a dense white fumes when a glass rod dipped in liquid ammonia is brought close to its mouth	Presence of chloride
6.	Action of MnO ₂ and Conc. H ₂ SO ₄ : Take a small amount of salt in a test tube, add pinch of MnO ₂ and about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame.	A greenish yellow gas turning starch iodide paper blue evolves	Presence of chloride
7.	Action of Conc. H ₂ SO ₄ and copper turning: Take a small quantity of salt in a dry test tube and add few copper turnings and about 1mL of Conc. H ₂ SO ₄ . Gently heat it.	No characteristic colour gas is observed	Abesence of nitrate
8.	Action of dil. NaOH solution: To a small quantity of a salt add about 1mL of dil. NaOH solution and gently heat it.	colourless gas with the pungent smell giving dense white fumes with a glass rod dipped in con. HCl evolves	Presence of ammonium salt
9.	Chromyl chloride test: Take a small quantity of salt in a test tube, add a pinch of potassium di chromate and three drops Conc. H ₂ SO ₄ . Gently heat it. Pass the vapours to enter another test tube containing about 0.5 mL of sodium hydroxide. If a yellow solution is obtained, add about 1mL each of dil. acetic acid and lead acetate.	A yellow ppt is obtained	Presence of chloride.

Analysis with sodium carbonate extract **Preparation of sodium carbonate extract:** Take 1 g of the given salt and 3 g of solid sodium carbonate in a 100 mL beaker. Add 20 g of distilled water then boiling the solution for few mins, filter collect the filtrate. The filtrate is called sodium carbonate extract. Test for halides: To about one mL of the sodium carbonate A curdy white precipitate(ppt) insoluble Presence of chloride in about 1mL of dil. Ammonia is formed extract add dil. HNO3 in drops with shaking until the effervescence ceases, and then add about 1mL of AgNO3, and shake it well. Test with barium chloride: To about one 11. mL of the sodium carbonate extract, add dil. No white ppt is formed Absence of sulphate acetic acid in drops with shaking until the effervescence ceases, then add 1mL of barium chloride solution and shake it well. Test with lead acetate: 12. To about 1 mL of the sodium carbonate No white ppt is formed Absence of sulphate extract, add 1 mL of dil acetic acid and heat it, until the effervescence ceases, and then add 1 mL of lead acetate. Brown ring test: To about 1 mL of the 13. sodium carbonate extract add dil. H₂SO₄ in drops with shaking until the effervescence ceases and about 0.5 mL of freshly No brown ring is formed Absence of nitrate prepared ferrous sulphate solution. Then keeping the test tube in a slanting position add Con.H₂SO₄ along the sides of the tube. Ammonium molybdate test: 14. To one portion of the extract, add dil HNO₃ Absence of phosphate until the effervescence ceases, then add No canary yellow ppt formed. about 1mL each of ammonium molybdate and Conc. HNO₃. Test with sodium nitro bruside: To about 15. 1mL of the sodium carbonate extract add 1 Absence of sulphide mL of dil .aommonia. Then add about few No purple colouration appears drops of sodium nitro prusside.

Preparation of simple salt solution for the analysis of cations: To a small amount of salt in a test tube add 3 m L of water, shake it and gently heat it. A clear solution is obtained. This solution is called "original salt solution".

16.	Group zero: To about 1 mL of the original salt solution add about 1mL each of Nessler's reagent and NaOH.	A chocolate brown ppt is obtained	Presence of zero group (ammonium.)
17.	Group 1: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it		Absence of 1 st group (Lead)
18.	Group 2 : Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil HCl, and shake it then pass H ₂ S gas.		Absence of 2 nd group (copper)

19	Group 3 : To about 1mL of the salt solution add about 1mL each of NH ₄ Cl and NH ₄ OH and shake it well.	No gelatinous white ppt is observed	Absence of 3 rd group Aluminium metal ion	
20.	Group 4 : To about 1mL of the salt solution add about 1mL each of NH ₄ Cl and NH ₄ OH and pass (H ₂ S) gas	No dirty white ppt is obtained	Absence of 4th group metal ion (Zn ^{2+,)}	
21	Group 5 : To salt solution add 1mL each ofNH ₄ Cl, NH ₄ OH and (NH ₄) ₂ CO ₃ and shake it well.	No white ppt is obtained	Absence of 5 th group metal ions (Ba ²⁺ , Ca ²⁺)	
22.	Group 6 : To about 1mL of the original salt solution add about 1mL each of NH ₄ Cl, NH ₄ OH and NH ₄ H ₂ PO ₄ , and scratch the sides of the test tube.	No white ppt is obtained	Abesence of Magnesium	
	Analysis of th	ne zero th group ppt :		
23.	To about 1mL of the original salt solution add about 1mL each of Nessler's reagent and NaOH.	A chocolate brown ppt is obtained	Presence of ammonium	
RESULT: The anion present : CHLORIDE The cation present : AMMONIUM The given simple salt : AMMONIUM CHLORIDE				

Systematic analysis of a (11 th) simple salt - Analysis of anion

Experiment No : Date :

S.	Experiment	Observation	Inference
1.	Colour : Note the colour of the salt.	colourless	Absence of copper ,iron salt
2.	Action of heat: A small amount of a salt is strongly heated in a dry test tube.	A colourless gas with the pungent smell, forming a dense white fumes when a glass rod dipped in Conc. HCl is brought close to its mouth	Presence of an ammonium salt
3.	Flame test: Take a small amount of salt in a watch glass. Add a drop of Conc. HCl to it and form a paste. Take the paste at the charred end of the splinter and introduce it near the Bunsen flame.	No characteristic colour flame is observed	Absence of copper, barium and calcium salt
4.	Action of dil. HCI: Take a small amount of salt in a test tube and add about 1mL of dil. HCl to it. Gently heat it in the Bunsen flame.	No characteristic colour gas , is observed	Absence of carbonate , sulphide
5.	Action of Conc.H ₂ SO ₄ : Take a small amount of a salt in a dry test tube, add about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame	A reddish brown gas turning moist fluorescein paper green evolves	Presence of bromide

6.	Action of MnO ₂ and Conc. H ₂ SO ₄ : Take a small amount of salt in a test tube, add pinch of MnO ₂ and about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the Bunsen flame.	A reddish brown gas turning moist fluorescein paper red evolves	Presence of bromide
7.	Action of Conc. H ₂ SO ₄ and copper turning: Take a small quantity of salt in a dry test tube and add few copper turnings and about 1mL of Conc. H ₂ SO ₄ . Gently heat it.	No characteristic colour gas is observed	Abesence of nitrate
8.	Action of dil. NaOH solution: To a small quantity of a salt add about 1mL of dil. NaOH solution and gently heat it.	colourless gas with the pungent smell giving dense white fumes with a glass rod dipped in con. HCl evolves	Presence of ammonium salt
9.	Chromyl chloride test: Take a small quantity of salt in a test tube, add a pinch of potassium di chromate and three drops Conc. H ₂ SO ₄ . Gently heat it. Pass the vapours to enter another test tube containing about 0.5 mL of sodium hydroxide. If a yellow solution is obtained, add about 1mL each of dil. acetic acid and lead acetate.	No yellow ppt is obtained	Absence of chloride.

Analysis with sodium carbonate extract

Preparation of sodium carbonate extract: Take 1 g of the given salt and 3 g of solid sodium carbonate in a 100 mL beaker. Add 20 g of distilled water then boiling the solution for few mins, filter collect the filtrate is called sodium carbonate extract.

10.	Test for halides: To about one mL of the sodium carbonate extract add dil. HNO3 in drops with shaking until the effervescence ceases, and then add about 1mL of AgNO3, and shake it well.	A pale yellow ppt sparingly soluble in ammonia is formed	Presence of bromide
11.	Test with barium chloride: To about one mL of the sodium carbonate extract, add dil. acetic acid in drops with shaking until the effervescence ceases, then add 1mL of barium chloride solution and shake it well.	No white ppt is formed	Absence of sulphate
12.	Test with lead acetate: To about 1 mL of the sodium carbonate extract, add 1 mL of dil acetic acid and heat it, until the effervescence ceases, and then add 1mL of lead acetate.	No white ppt is formed	Absence of sulphate
13.	Brown ring test: To about 1 mL o f the sodium carbonate extract add dil. H ₂ SO ₄ in drops with shaking until the effervescence ceases and about 0.5 mL of freshly prepared ferrous sulphate solution. Then keeping the test tube in a slanting position add Con. H ₂ SO ₄ along the sides of the test tube.	No brown ring is formed	Absence of nitrate

14.	Ammonium molybdate test: To one portion of the extract, add dil HNO ₃ until the effervescence ceases, then add about 1mL each of ammonium molybdate and Conc. HNO ₃ .		Absence of phosphate
15.	Test with sodium nitro bruside: To about 1mL of the sodium carbonate extract add 1 mL of dil .aommonia. Then add about few drops of sodium nitro prusside.	No purple colouration appears	Absence of sulphide

Preparation of simple salt solution for the analysis of cations:

To a small amount of salt in a test tube add 3 m L of water, shake it and gently heat it. A clear solution is obtained. This solution is called "original salt solution".

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Group	Sana	ration
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16.	Group zero :	- Coparation	Presence of zero
16.	To about 1 mL of the original salt solution add about 1mL each of Nessler's	A chocolate brown ppt is obtained	group (ammonium.)
	reagent and NaOH.		
17.	Group 1: Take about 1 mL of the salt solution in a test tube Add about 1 mL of dil	No white ppt is observed	Absence of 1 st group (Lead)
18.	HCl, and shake it Group 2: Take about 1 mL of the salt		Absence of 2 nd group
10.	solution in a test tube Add about 1 mL of dil HCl, and shake it then pass H ₂ S gas.	No Black ppt is observed	(copper)
19	Group 3 : To about 1mL of the salt solution add about 1mL each of NH ₄ Cl and NH ₄ OH and shake it well.	No gelatinous white ppt is observed	Absence of 3 rd group Aluminium metal ion
20.	Group 4: To about 1mL of the salt solution add about 1mL each of NH ₄ Cl and NH ₄ OH and pass (H ₂ S) gas	No dirty white ppt is obtained	Absence of 4th group metal ion (Zn ^{2+,)}
21	Group 5 : To salt solution add 1mL each ofNH₄Cl, NH₄OH and (NH₄)₂ CO₃ and shake it well.	No white ppt is obtained	Absence of 5 th group metal ions (Ba ²⁺ , Ca ²⁺)
22.	Group 6 : To about 1mL of the original salt solution add about 1mL each of NH ₄ Cl, NH ₄ OH and NH ₄ H ₂ PO ₄ , and scratch the sides of the test tube.	No white ppt is obtained	Abesence of Magnesium
	Analysis of t	the zero th group ppt :	
23.	To about 1mL of the original salt solution add about 1mL each of Nessler's reagent and NaOH.	A chocolate brown ppt is obtained	Presence of ammonium
RES	ULT : The anion present : BROMIDE The cation present : AMMONIUM		

The given simple salt : AMMONIUM BROMIDE



Systematic analysis of a (11 th) simple salt - Analysis of anions

S.	Experiment	Observation	Inference
1.	Colour : Note the colour of the salt.		
2.	Action of heat:		
۷.	A small amount of a salt is strongly heated in a dry		
	test tube.		
	test tube.		
3.	Flame test: Take a small amount of salt in a watch		
J.			
	glass. Add a drop of Conc. HCl to it and form a paste. Take the paste at the charred end of the		
	splinter and introduce it near the Bunsen flame		
4.	Action of dil. HCl:		
	Take a small amount of salt in a test tube and add	. (/)	
	about 1mL of dil. HCl to it. Gently heat it in the		
	Bunsen flame.		
5.	Action of Conc.H ₂ SO ₄ :		
	Take a small amount of a salt in a dry test tube, add		
	about 0.5mL of Conc. H ₂ SO ₄ and gently heat it in the		
	Bunsen flame		
6.	Action of MnO ₂ and Conc. H ₂ SO ₄ :	70	
	Take a small amount of salt in a test tube, add pinch		
	of MnO ₂ and about 0.5mL of Conc. H ₂ SO ₄ and gently	4/7	
	heat it in the Bunsen flame.		
7.	Action of Conc. H ₂ SO ₄ and copper turning:		
	Take a small quantity of salt in a dry test tube and		
	add few copper turnings and about 1mL of Conc.		
	H ₂ SO ₄ .Gently heat it.		
8.	Action of dil. NaOH solution:		
	To a small quantity of a salt add about 1mL of dil.		
	NaOH solution and gently heat it.		
9.	Chromyl chloride test: Take a small quantity of		
	salt in a test tube, add a pinch of potassium di		
	chromate and three drops Conc. H ₂ SO ₄ . Gently heat		
	it. Pass the vapours to enter another test tube		
	containing about 0.5 mL of sodium hydroxide. If a		
	yellow solution is obtained, add about 1mL each of		
	dil. acetic acid and lead acetate.	a carbonato extract	
Dra	Analysis with sodium	cardonate extract	
Fre	paration of sodium carbonate extract: Take 1g of the given salt and 3g of solid s	odium carbonate in a100ml booker Ad	d 20a of distilled water to
it ⊢	leat the beaker with its contents on a hot plate or Bunse		
	r paper in a funnel and collect the filtrate in an another l	<u> </u>	
10.	Test for halides:	Summer in the market is sailed socially during	J. J
	To about one mL of the sodium carbonate extract		
	add dil. HNO ₃ in drops with shaking until the		
	effervescence ceases, and then add about 1mL of		
	AgNO ₃ , and shake it well.		
11.	Test with barium chloride: To about one mL of		
	the sodium carbonate extract, add dil. acetic acid		
	in drops with shaking until the effervescence		
	ceases, then add 1mL of barium chloride solution		
	and shake it well.		

12.	Test with lead acetate: To about 1 mL of the sodium carbonate extract, add 1 mL of dil acetic acid and heat it, until the effervescence ceases, and then add 1mL of lead acetate.		
13.	Brown ring test: To about 1 mL of the sodium carbonate extract add dil. H ₂ SO ₄ in drops with shaking until the effervescence ceases and about 0.5 mL of freshly prepared ferrous sulphate solution. Then keeping the test tube in a slanting position add Conc. H ₂ SO ₄ along the sides of the test tube.		
14.	Ammonium molybdate test: To one portion of the extract, add dil HNO ₃ until the effervescence ceases, then add about 1mL each of ammonium molybdate and Conc. HNO ₃ .	, (Z	
15.	Test with sodium nitro bruside: To about 1mL of the sodium carbonate extract add 1 mL of dil .aommonia. Then add about few drops of sodium nitro prusside.		

Preparation of solution of the simple salt for the analysis of cations:

To a small amount of salt in a test tube add 2 to 3 m L of water, shake it and gently heat it. A clear solution is obtained. This solution is called "original solution".

(FOR: Copper Carbonate, Zinc Sulphide, Calcium Carbonate, Magnesium Carbonate, Magnesium Phosphate)

Take a small amount of salt in an test tube, add 3 mL of dil. HCl shake it and gently heat it. This clear solution is called "original solution".