

MUNIRAJ T POST GRADUATE TEACHER IN CHEMISTRY , MODEL SCHOOL , PALACODE DHARMAPURI

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. 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.H₂SO₄: 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 MnO₂ and Conc. H₂SO₄: 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. H₂SO₄ 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. HNO ₃ in drops with shaking until the effervescence ceases, then add 1mL of AgNO ₃ , and shake it well.	No characteristic ppt is observed	Absence of chloride , bromide , sulphide

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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 of the sodium carbonate extract add dil. H_2SO_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_2SO_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 .	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 .ammonia. 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 mL 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 : 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 1st 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_2CrO_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

RESULT :

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

Experiment 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. 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. H₂SO₄: 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 MnO₂ and Conc. H₂SO₄: 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. H₂SO₄ 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	Absence 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: 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 .	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 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 , dil HNO ₃ until the effervescence ceases, then add 1mL each of ammonium molybdate and Con.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".

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)

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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 nd group ppt:			
To the ppt add about 1mL of dil HNO ₃ and 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
RESULT : The anion present : SULPHATE The cation present : COPPER The given simple salt : COPPER SULPHATE			

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.	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. 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.	Brisk effervescence is noted. colourless, odourless gas turning lime water milky evolves	Presence of carbonate
5.	Action of Conc. H₂SO₄: 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 MnO₂ and Conc. H₂SO₄: 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

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7.	Action of Conc. H_2SO_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_2SO_4 . Gently heat it.	No characteristic colour gas is observed	Absence 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_2SO_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
<p style="text-align: center;">Analysis with sodium carbonate extract</p> <p>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.</p>			
10.	Test for halides: 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 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 of the sodium carbonate extract add dil. H_2SO_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_2SO_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 prusside: To about 1mL of the sodium carbonate extract add 1 mL of dil . ammonia. 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 mL 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)

Analysis of the 2 nd group ppt:

To the ppt add about 1mL of dil HNO₃ and 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

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

Experiment No :

Date :

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. 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 colour gas, is observed	Absence of carbonate, sulphide
5.	Action of Conc. H₂SO₄: 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

6.	Action of MnO_2 and Conc. H_2SO_4: Take a small amount of salt in a test tube, add pinch of MnO_2 and about 0.5mL of Conc. H_2SO_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_2SO_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_2SO_4 . Gently heat it.	No characteristic colour gas is observed	Absence 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_2SO_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.
<p style="text-align: center;">Analysis with sodium carbonate extract</p> <p>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.</p>			
10.	Test for halides: 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.	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, add 1mL of lead acetate.	No white ppt is formed	Absence of sulphate
13.	Brown ring test: To about 1 mL of the sodium carbonate extract add dil. H_2SO_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_2SO_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

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15.	Test with sodium nitro prusside: To about 1mL of the sodium carbonate extract add 1 mL of dil .ammonia. Then add about few drops of sodium nitro prusside.	No purple colouration appears	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 mL 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 : 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	A brown ppt is obtained	presence of 3 rd group Ferric metal ion

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 ferrocyanide.	A blue ppt is obtained	Presence of iron
22.	ii.) To an another portion of the ppt add about 1 mL of dil. HNO ₃ 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 :

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. 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. H₂SO₄: 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 MnO₂ and Conc. H₂SO₄: 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. H₂SO₄ 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	Absence 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: 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

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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_2SO_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 o f the sodium carbonate extract add dil. H_2SO_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_2SO_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".

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_2S 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_4Cl and NH_4OH and shake it well	gelatinous white ppt is observed	presence of 3 rd group Aluminium metal ion

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Analysis of 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
RESULT : 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

Experiment t 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. 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.H₂SO₄: 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 MnO₂ and Conc. H₂SO₄: 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. H₂SO₄ 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: 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 of the sodium carbonate extract add dil. H_2SO_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_2SO_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 .	No canary yellow ppt formed.	Absence of phosphate
15.	Test with sodium nitro prusside: To about 1mL of the sodium carbonate extract add 1 mL of dil .ammonia. 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 mL 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 : 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)

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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 :			
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
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

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.	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.H₂SO₄: 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 MnO₂ and Conc. H₂SO₄: 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. H₂SO₄ 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	Absence 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_2SO_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: 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 .	A white ppt is formed insoluble in dil H_2SO_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 o f the sodium carbonate extract add dil. H_2SO_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_2SO_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 .ammonia. 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 mL 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 : 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	dirty white ppt is obtained	presence of 4 th group metal ion (Zn²⁺.)

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 1.5mL of dil. NaOH and boil it	A clear solution is obtained	Presence of zinc

RESULT :

The anion present : **SULPHATE**
 The cation present : **ZINC**
 The given simple salt : **ZINC SULPHATE**

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.	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.	A colourless gas with a rotten egg smell turning a paper dipped in lead acetate shining black evolves	Presence of sulphide

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5.	Action of Conc. H₂SO₄: 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 MnO₂ and Conc. H₂SO₄: 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. H₂SO₄ 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	Absence 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: 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.	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

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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 .ammonia. 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 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_2S 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_4Cl and NH_4OH 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_4Cl and NH_4OH and pass (H_2S) gas	dirty white ppt is obtained	presence of 4th group metal ion (Zn^{2+}.)

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 1.5mL of dil. NaOH and boil it	A clear solution is obtained	Presence of zinc

RESULT :

The anion present : **SULPHIDE**
 The cation present : **ZINC**
 The given simple salt : **ZINC SULPHIDE**

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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.	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. 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.	Brisk effervescence is noted. colourless, odourless gas turning lime water milky evolves	Presence of carbonate
5.	Action of Conc. H₂SO₄: 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 MnO₂ and Conc. H₂SO₄: 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. H₂SO₄ 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	Absence 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: 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

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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 of the sodium carbonate extract add dil. H_2SO_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_2SO_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 prusside: To about 1mL of the sodium carbonate extract add 1 mL of dil .ammonia. 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 mL 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_2S 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_4Cl and NH_4OH 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_4Cl and NH_4OH and pass (H_2S) gas	No dirty white ppt is obtained	Absence of 4th group metal ion (Zn^{2+})
21.	Group 5 : To salt solution add 1mL each of NH_4Cl , NH_4OH and $(NH_4)_2CO_3$ and shake it well.	A white ppt is obtained	presence of 5 th group metal ions (Ba^{2+} , Ca^{2+})

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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 potassium chromate	No yellow ppt is obtained	Absence of barium
23.	ii). To an another portion add about 1mL of ammonium sulphate	A white ppt is obtained. Filter the ppt then Transfer the Residue, Add a drop of Conc. HCl. Take the residue introduce near the Bunsen flame. A crimson red colour is seen.	Presence of Calcium

RESULT :

The anion present : **CARBONATE**
 The cation present : **CALCIUM**
 The given simple salt : **CALCIUM CARBONATE**

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.	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. 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 colour gas , is observed	Absence of carbonate , sulphide
5.	Action of Conc. H₂SO₄: 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. It gives a dense white fumes when a glass rod dipped in liquid ammonia is brought close to its mouth	Presence of chloride
6.	Action of MnO₂ and Conc. H₂SO₄: 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. H₂SO₄ 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	Absence 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_2SO_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.
<p style="text-align: center;">Analysis with sodium carbonate extract</p> <p>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.</p>			
10.	Test for halides: 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.	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_2SO_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_2SO_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 .ammonia. 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 mL 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 : 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 of NH ₄ Cl, NH ₄ OH and (NH ₄) ₂ CO ₃ and shake it well.	A white ppt is obtained	presence of 5 th group metal ions (Ba²⁺, Ca²⁺)

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 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

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.	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. 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.H₂SO₄: 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 MnO₂ and Conc. H₂SO₄: 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. H₂SO₄ 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	Absence 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
<p style="text-align: center;">Analysis with sodium carbonate extract</p> <p>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.</p>			
10.	Test for halides: 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

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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_2SO_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 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_2SO_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_2SO_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 prusside: To about 1mL of the sodium carbonate extract add 1 mL of dil .ammonia. 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 mL 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 : 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_2S 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_4Cl and NH_4OH 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_4Cl and NH_4OH and pass (H_2S) gas	No dirty white ppt is obtained	Absence of 4th group metal ion (Zn^{2+})
21.	Group 5 : To salt solution add 1mL each of NH_4Cl , NH_4OH and $(\text{NH}_4)_2\text{CO}_3$ and shake it well.	No white ppt is obtained	Absence of 5 th group metal ions (Ba^{2+} , Ca^{2+})

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22.	Group 6 : To about 1mL of the original salt solution add about 1mL each of NH_4Cl , NH_4OH and $\text{NH}_4\text{H}_2\text{PO}_4$, 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.	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
RESULT : The anion present : SULPHATE The cation present : MAGNESIUM The given simple salt : MAGNESIUM SULPHATE			

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.	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. 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.	Brisk effervescence is noted. colourless, odourless gas turning lime water milky evolves	Presence of carbonate
5.	Action of Conc. H_2SO_4: Take a small amount of a salt in a dry test tube, add about 0.5mL of Conc. H_2SO_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_2SO_4: Take a small amount of salt in a test tube, add pinch of MnO_2 and about 0.5mL of Conc. H_2SO_4 and gently heat it in the Bunsen flame.	No characteristic colour gas is observed	Absence of chloride , bromide
7.	Action of Conc. H_2SO_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_2SO_4 . Gently heat it.	No characteristic colour gas is observed	Absence of nitrate

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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_2SO_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: 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 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_2SO_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_2SO_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".			

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.	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 of NH 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.	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
RESULT : The anion present : CARBONATE The cation present : MAGNESIUM The given simple salt : MAGNESIUM CARBONATE			

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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.	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. 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 Brisk effervescence is noted.	Absence of carbonate
5.	Action of Conc. H₂SO₄: Take a small amount of a salt in a dry test tube, add 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 MnO₂ and Conc. H₂SO₄: 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. H₂SO₄ 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	Absence 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

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. 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 formed	Absence of sulphate

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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_2SO_4 in drops with shaking until the effervescence ceases and about 0.5 ml of freshly prepared ferrous sulphate solution. Then add Conc. H_2SO_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 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_2S 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_4Cl and NH_4OH 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_4Cl and NH_4OH and pass (H_2S) gas	No dirty white ppt is obtained	Absence of 4th group metal ion (Zn^{2+})
21.	Group 5 : To salt solution add 1mL each of NH_4Cl , NH_4OH 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_4Cl , NH_4OH and $NH_4H_2PO_4$, 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.	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

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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

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 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. 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 colour gas , is observed	Absence of carbonate , sulphide
5.	Action of Conc. H₂SO₄: 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. It gives a dense white fumes when a glass rod dipped in liquid ammonia is brought close to its mouth	Presence of chloride
6.	Action of MnO₂ and Conc. H₂SO₄: 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. H₂SO₄ 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	Absence 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.

10.	Test for halides: 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.	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 1 mL of lead acetate.	No white ppt is formed	Absence 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 Con.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 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 .ammonia. 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 : 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	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)

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19	Group 3 : To about 1mL of the salt solution add about 1mL each of NH_4Cl and NH_4OH 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_4Cl and NH_4OH and pass (H_2S) gas	No dirty white ppt is obtained	Absence of 4th group metal ion (Zn^{2+})
21	Group 5 : To salt solution add 1mL each of NH_4Cl , NH_4OH and $(\text{NH}_4)_2\text{CO}_3$ 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_4Cl , NH_4OH and $\text{NH}_4\text{H}_2\text{PO}_4$, and scratch the sides of the test tube.	No white ppt is obtained	Absence of Magnesium
Analysis of 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
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. 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 colour gas , is observed	Absence of carbonate , sulphide
5.	Action of Conc. H_2SO_4: Take a small amount of a salt in a dry test tube, add about 0.5mL of Conc. H_2SO_4 and gently heat it in the Bunsen flame	A reddish brown gas turning moist fluorescein paper green evolves	Presence of bromide

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6.	Action of MnO_2 and Conc. H_2SO_4: Take a small amount of salt in a test tube, add pinch of MnO_2 and about 0.5mL of Conc. H_2SO_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_2SO_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_2SO_4 . Gently heat it.	No characteristic colour gas is observed	Absence 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_2SO_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.
<p style="text-align: center;">Analysis with sodium carbonate extract</p> <p>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.</p>			
10.	Test for halides: 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.	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 of the sodium carbonate extract add dil. H_2SO_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_2SO_4 along the sides of the test tube.	No brown ring is formed	Absence of nitrate

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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 .ammonia. 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 : 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	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_2S 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_4Cl and NH_4OH 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_4Cl and NH_4OH and pass (H_2S) gas	No dirty white ppt is obtained	Absence of 4th group metal ion (Zn^{2+})
21.	Group 5 : To salt solution add 1mL each of NH_4Cl , NH_4OH and $(\text{NH}_4)_2\text{CO}_3$ 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_4Cl , NH_4OH and $\text{NH}_4\text{H}_2\text{PO}_4$, and scratch the sides of the test tube.	No white ppt is obtained	Absence of Magnesium

Analysis of 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
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RESULT :

The anion present : **BROMIDE**
 The cation present : **AMMONIUM**
 The given simple salt : **AMMONIUM BROMIDE**



THANK YOU

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

Experiment No :

Date :

S.	Experiment	Observation	Inference
1.	Colour : Note the colour of the salt.		
2.	Action of heat: A small amount of a salt is strongly heated in a dry test tube.		
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		
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. H₂SO₄: 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 MnO₂ and Conc. H₂SO₄: 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.		
7.	Action of Conc. H₂SO₄ 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 dichromate 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.		
Analysis with sodium carbonate extract			
Preparation of sodium carbonate extract: Take 1g of the given salt and 3g of solid sodium carbonate in a 100mL beaker. Add 20g of distilled water to it. Heat the beaker with its contents on a hot plate or Bunsen burner. After boiling the solution for few mins, filter it through a filter paper in a funnel and collect the filtrate in another beaker. The filtrate is called sodium carbonate extract.			
10.	Test for halides: 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 o f the sodium carbonate extract add dil. H_2SO_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_2SO_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 .		
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"..

Group Separation