

## ANALYSIS OF SIMPLE SALT-ANIONS

<u>EXPERIMENT</u>	<u>OBSERVATION</u>	<u>INFERENCE</u>
<p><b><u>Test for carbonate</u></b></p> <p>A little of salt solution is treated with dil.Hcl</p>	Brisk effer vescence with the evolution of colorless odorless gas	Presence of carbonate
<p><b><u>Conformatory test for carbonate</u></b></p> <p>1) The above gas is passed through 1 ml of lime water taken in a test tube and shaken well</p> <p>2) A little of the salt solution is treated with Bacl<sub>2</sub> solution</p>	<p>Lime water turns milky</p> <p>A white precipitate is obtained which is soluble in dil.Hcl</p>	<p>Presence of carbonate is confirmed</p> <p>Presence of carbonate is confirmed</p>
<p><b><u>Test for Acetate(CH<sub>3</sub>COO-</u></b></p> <p>A little of salt is rubbed with dil.H<sub>2</sub>So<sub>4</sub></p>	<p>a)smell of vinegar</p> <p>b)No charatrstic reaction</p>	<p>Presence of acetate</p> <p>Absence of acetate</p>
<p><b><u>Conformatory test for Acetate</u></b></p> <p>1) A little of the salt solution is treated with neutral ferric chloride solution</p> <p>2)A little of salt solution is warmed with few drops of conc.H<sub>2</sub>so<sub>4</sub> and ethyl alcohol is poured into excess of water</p>	<p>A deep red coloration is obtained</p> <p>Pleasant fruity smell is obtained</p>	<p>Presence of acetate is confirmed</p> <p>Presence of acetate is confirmed</p>
<p><b><u>Test for chloride(cl-)</u></b></p> <p>A little of the salt is warmed with con.H<sub>2</sub>So<sub>4</sub></p>	A colorless gas fuming in air gives dense white fumes when a glass rod dipped in NH <sub>4</sub> oH is shown in the mouth of the test tube	Presence of chloride

### **Conformatory Test**

1) A little of the salt is heated with con.  $H_2SO_4$  and  $MnO_2$

2) A little of the salt solution is acidified with dil.  $HNO_3$  and then  $AgNO_3$  solution is added

### **Test for nitrate ( $NO_3^-$ )**

A little of the salt is heated with conc.  $H_2SO_4$  and then paper balls are added

### **Confirmatory test**

1) A little of salt mixed with equal volume of freshly prepared ferrous sulphate solution and shaken well con.  $H_2SO_4$  is then added to this mixture along the walls of the test tube

2) A little of the salt solution heated with zinc dust and  $NaOH$

### **Test for Sulphate**

A little of the salt solution is diluted with dil.  $HCl$  and then  $BaCl_2$  added to the above solution

Confirmatory Test

1) To a little of the above precipitate excess of dil.  $HCl$  is added

Greenish yellow gas with a pungent smell is obtained

A white curdy precipitate which is completely soluble in excess of  $NH_4OH$  solution is obtained

Reddish brown fumes are evolved

A brown ring is formed at the junction of the two

A colorless pungent smelling gas is evolved which solution gives dense white fumes when a glass rod is dipped in con.  $HCl$  is shown at the mouth of test tube

White precipitate is obtained

The precipitate is insoluble

Presence of chloride is confirmed

Presence of chloride is confirmed

Presence of nitrate

Presence of nitrate is confirmed

Presence of nitrate is confirmed

Presence of sulphate

Presence of sulphate is confirmed

2) A little of the salt solution acidified with acetic acid and then lead acetate solution is added

A white precipitate is obtained

Presence of sulphate is again confirmed

## SYSTEMATIC ANALYSIS OF CATIONS

<u>EXPERIMENT</u>	<u>OBSERVATION</u>	<u>INFERENCE</u>
<p>The stock solution of salt is prepared</p> <p>A little of the salt solution is treated with sodium carbonate solution</p> <p><b><u>Analysis of alkali metal</u></b></p> <p>A little of the salt solution is treated with NaoH solution</p> <p><b><u>Confirmatory Test</u></b></p> <p>To about 1 ml of neslurs reagent two drops of salt solution and two drops of NaoH is added</p> <p><b><u>Analysis of Group metal</u></b></p> <p><b><u>Group 1 Lead</u></b></p> <p>A little of salt solution is treated with dil.Hcl</p> <p><b><u>Confirmatory test</u></b></p> <p>A little of the above precipitate is boiled with water in excess</p>	<p>In cold water</p> <p>a)No precipitate b)A precipitate</p> <p>Colorless gas with smell of NH<sub>3</sub> giving dense white fumes when a glass rod dipped in con.Hcl is shown in the mouth of the test tube</p> <p>A brown precipitate is obtained</p> <p>White precipitate is obtained</p> <p>The precipitate dissolves</p>	<p>Presence of alkali metal</p> <p>Presence of group metal</p> <p>Presence of Ammonium</p> <p>Presence of ammonium is confirmed</p> <p>Presence of lead</p> <p>Presence of lead is confirmed</p>

<p>To one portion of the above hot solution potassium chromate solution is added</p>	<p>A yellow precipitate is obtained</p>	<p>Presence of lead is again confirmed</p>
<p>To the second portion of the hot solution potassium iodine solution is added</p>	<p>A yellow ppt is formed which is soluble in hot water and reappearing as golden yellow sprangles on cooling</p>	<p>Presence of lead is again confirmed</p>
<p><b><u>GROUP II Cadmium(cd2-1)</u></b></p> <p>A little of the salt solution is treated with dil.Hcl and then H<sub>2</sub>S is passed</p>	<p>A yellow precipitate is formed which is soluble in hot water</p>	<p>Presence of Cadmium</p>
<p><b><u>Confirmatory test</u></b></p> <p>1)A little of the salt solution is treated with NH<sub>4</sub>OH solution drop by drop in excess</p> <p>2)H<sub>2</sub>s is passed through the above Solution</p>	<p>White precipitate which dissolves in excess of NH<sub>4</sub>OH is obtained</p> <p>An yellow precipitate is formed</p>	<p>Presence of Cadmium confirmed</p> <p>Presence of Cadmium again confirmed</p>
<p><b><u>Group III Aluminium (Al<sup>3+</sup>)</u></b></p> <p>A little of the salt solution is treated with solid NH<sub>4</sub>CL and then excess of NH<sub>4</sub>OH solution is added</p>	<p>A white gelatinous precipitate</p>	<p>Presence of Aluminium</p>
<p><b><u>Confirmatory Test</u></b></p> <p>1)NaoH solution is added drop by drop in excess to little of the salt solution</p>	<p>A white precipitate which dissolves in excess of NaoH solution</p>	<p>Presence of Aluminium is confirmed</p>

<p>A little of the salt solution is boiled with a few drops of con.HNO<sub>3</sub> and cobalt nitrate solution is added. A piece of filter paper dipped in it is turned in to ash by burning</p>	<p>Blue ash is Obtained</p>	<p>Presence of Al<sup>3+</sup> is</p>
<p><b><u>Group 4 Zn<sup>2+</sup> or Mn<sup>2+</sup></u></b></p>		
<p>A little of the salt solution is treated with solid NH<sub>4</sub>Cl and then excess of NH<sub>4</sub>OH solution is added.Through the above solution H<sub>2</sub>S is passed</p>	<p>a)A white precipitate b)Flesh colored precipitate</p>	<p>Presence of Zn<sup>2+</sup> Presence of Mn<sup>2+</sup></p>
<p><b><u>Confirmatory Test (Zn<sup>2+</sup>)</u></b></p>		
<p>NaoH solution is added drop by drop in excess to a little of the salt solution</p>		
<p>A little of the salt solution is boiled with con.HNO<sub>3</sub> and few drops of Cobalt Nitrate solution. A piece of filter paper is dipped in it and turned into ash</p>	<p>A white precipitate is formed which dissolves in excess of NaoH Green Ash is Obtained</p>	<p>Presence of Zn<sup>2+</sup> is confirmed Presence of Zn<sup>2+</sup> is again confirmed</p>
<p><b><u>Confirmatory Test (Mn<sup>2+</sup>)</u></b></p>		
<p>NaoH solution is added drop by drop in excess to a little of salt solution and shaken well</p>	<p>A white Precipitate is formed with on keeping turns into brown</p>	<p>Presence of Mn<sup>2+</sup> is confirmed</p>
<p>A little of the salt solution boiled with Con.HNO<sub>3</sub> to boil and is diluted with water and is allowed to stance</p>	<p>The supernatant solution turns to pink</p>	<p>Presence of Mn<sup>2+</sup> is again confirmed</p>
<p><b><u>Group 5( Ba<sup>2+</sup>,Sr<sup>2+</sup>,Ca<sup>2+</sup>)</u></b></p>		
<p>NH<sub>4</sub>cl, NH<sub>4</sub>OH,(NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub> solutions are added to a little of salt solution</p>	<p>A white precipitate is obtained</p>	<p>Presence of Ba<sup>2+</sup>,Sr<sup>2+</sup></p>

### **Analysis of group 5**

A little of the salt solution is treated with acetic acid & potassium chromate solution

A little of the salt solution is treated with dil. H<sub>2</sub>SO<sub>4</sub>

A little of the salt solution is treated with NH<sub>4</sub>Cl, NH<sub>4</sub>OH, ammonium oxalate solution

### **Confirmatory Test (Ca<sup>2+</sup>)**

A little of the salt solution is made into a paste with Con. HCl and a small portion of the paste is shown into the non luminous flame by charid spender

### **Group 6 (Mg<sup>2+</sup>)**

NH<sub>4</sub>Cl, NH<sub>4</sub>OH, di sodium hydrogen phosphate solution are added to a little of salt solution

### **Confirmatory Test**

NaOH solution is added 10 drop to excess of salt solution

A little of the salt solution is boiled with Con. HNO<sub>3</sub> & Cobalt nitrate solution A filter paper dipped in it is turned to ash by burning

No characteristic precipitate

No characteristic precipitate

A white precipitate is obtained

Brisk red color is seen in the color of flame

A white precipitate is obtained

A white precipitate solution of NH<sub>4</sub>Cl is obtained

A pink ash is obtained

Absence of Ba<sup>2+</sup>

Absence of Sr<sup>2+</sup>

Presence of Ca<sup>2+</sup>

Presence of Ca<sup>2+</sup> is confirmed

Presence of Mg<sup>2+</sup> confirmed

Presence of Mg<sup>2+</sup> is confirmed

Presence of Mg<sup>2+</sup> is again confirmed

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