INORGANIC

Aim: - To identify the given inorganic compound for its acidic and basic radical.

Apparatus: - Chemical Reagent, Test Tube, Test Tube holder, Spatula, Burner

Procedure:- (Click On The Required Radical to see the procedure)

Acidic Radical:-

Group A:- CO_3^{2-}, S^{2-}, SO_3^{2-}, NO_2^-, CrO_4^{2-}

Group B:- Cl^-, Br^-, I^-, NO_3^-, CH_3COO^-, $C_2O_4^{2-}$

Group C:- SO_4^{2-}, PO_4^{3-}

Basic Radical:-

Group 0:- NH_4^+

Group 1:- Pb^{2+} , Ag^+

Group 2:- Pb^{2+}, Cu^{2+}, As^+

Group 3:- Fe^{3+}, Al^{3+}

Group 4:- Mn^{2+}, Zn^{2+}, Ni^{2+}, Co^{2+}

Group 5:- Ca^{2+}, Ba^{2+}, Sr^{2+}

Group 6:- Mg^{2+}

Result:- The given salt contains _____ as acidic radical and _____ as basic radical.

CARBONATE

Preliminary Test:-

Experiment	Observation	Inference
Added dilute sulphuric acid to given salt.	Gas with brisk effervescence evolved.	Carbonate may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Pass the above evolved gas through lime water.	Lime water turns milky.	Carbonate confirmed.

Chemical Equations:-

Ionic equation:-

$CO_3^{2-}{}_{(s)} + 2H^+_{(aq)} \rightarrow H_2O_{(l)} + CO_{2(g)}$

$CO_{2(g)} + Ca(OH)_{2(aq)} \rightarrow CaCO_{3(s)(milky)} + H_2O_{(l)}$

SULPHIDE

Preliminary Test:-

Experiment	Observation	Inference
Added dilute sulphuric acid to given salt.	Gas with smell of rotten eggs evolved.	Sulphide may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added a few drops lead(II) of ethanoate solution.	Black precipitate of lead sulphide formed.	Sulphide confirmed.

Chemical Equations:-

Ionic equation:-

$MS_{(s)} + 2H^{+}_{(aq)} \rightarrow M^{2+}_{(aq)} + H_2S_{(g}$

$Pb^{2+}_{(aq)} + S^{2-}_{(aq)} \rightarrow PbS_{(s)}$

SULPHITE

Preliminary Test:-

Experiment	Observation	Inference
Added dilute sulphuric acid to given salt.	Gas with smell of burning sulphur evolved.	Sulphite may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Add barium chloride to the salt.	A white ppt. of barium sulphite formed which dissolved in excess hydrochloric acid to give a clear colourless solution.	Sulphite confirmed.

Chemical Equations:-

Ionic equation:-

$Ba^{2+}_{(aq)} + SO_3^{2-}{}_{(aq)} \rightarrow BaSO_{3(s)}$

NITRITE

Preliminary Test:-

Experiment	Observation	Inference
Added dilute sulphuric acid to given salt.	Reddish brown gas with pungent smell evolved.	Nitrite may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added potassium permanganate solution.	Pink colour of potassium permanganate discharged.	Nitrite confirmed.

Chemical Equations:-

Ionic equation:-

$NO_2^- + H_2SO_{4(aq)} \rightarrow NO_{(g)} + SO_4^{2-} + H_2O_{(l)}$

$2KMnO_{4(Pink)} + 3H_2SO_4 + 5KNO_2 \rightarrow K_2SO_{4(Colourless)} + 2MnSO_4 + 5KNO_3 + 3H_2O$

CHROMATE

Preliminary Test:-

Experiment	Observation	Inference
Added dilute sulphuric acid to given salt.	Solution turned yellow.	Chromate may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added barium chloride solution.	Yellow precipitate formed.	Chromate confirmed.

Chemical Equations:-

Ionic equation:-

$CrO_4^{2-}{}_{(aq)} + 2H^+{}_{(aq)} \rightarrow Cr_2O_7^{2-}{}_{(aq)(yellow)}$

$Ba^{2+}{}_{(aq)} + CrO_4^{2-}{}_{(aq)} \rightarrow BaCrO_{4(s)(yellow)}$

CHLORIDE

Preliminary Test:-

Experiment	Observation	Inference
Added dilute sulphuric acid to given salt.	No effect.	Carbonate, sulphide , sulphite, nitrate absent.
Added concentrated sulphuric acid to given salt.	Colourless gas with pungent smell evolved.	Chloride may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added few potassiumdichromate crystals and concentrated sulphuric acid and heated. Passed the vapors through the test tube which contains sodium hydroxide solution. To this yellow solution, added dilute CH_3COOH and lead acetate solution.	Yellow coloured precipitate is formed.	Chloride confirmed.

Chemical Equations:-

$$K_2Cr_2O_7 + 4NaCl + 6H_2SO_4 \longrightarrow 2KHSO_4 + 4NaHSO_3 + 2CrO_2Cl_2$$

chromyl chloride

(orange-red vapours)

BROMIDE

Preliminary Test:-

Experiment	Observation	Inference
Added dilute sulphuric acid to given salt.	No effect.	Carbonate, sulphide , sulphite, nitrate absent.
Added concentrated sulphuric acid to given salt.	Brown colour gas evolved.	Nitrate or Bromide may be present.
Added copper turnings.	No effect.	Bromide may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added dilute nitric acid and silver nitrate solution	A pale yellow precipitate formed.	Bromide confirmed.

Chemical Equations:-

Ionic equation:-

$Ag^{+}_{(aq)} + Br^{-}_{(aq)} \rightarrow AgBr_{(s)(yellow)}$

IODIDE

Preliminary Test:-

Experiment	Observation	Inference
Added dilute sulphuric acid to given salt.	No effect.	Carbonate, sulphide , sulphite, nitrate absent.
Added concentrated sulphuric acid to given salt.	Violet colour gas evolved.	Iodide may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added dilute nitric acid and silver nitrate solution	A pale yellow precipitate formed.	Iodide confirmed.

Chemical Equations:-

Ionic equation:-

$Ag^{+}_{(aq)} + I^{-}_{(aq)} \rightarrow AgI_{(s)(yellow)}$

NITRATE

Preliminary Test:-

Experiment	Observation	Inference
Added dilute sulphuric acid to given salt.	No effect.	Carbonate, sulphide , sulphite, nitrate absent.
Added concentrated sulphuric acid to given salt.	Brown colour gas evolved.	Nitrate or Bromide may be present.
Added copper turnings.	Brown colour intensifies.	Nitrate may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added fresh ferrous sulphate, nitric acid to salt. Added concentrated sulphuric acid alsong the walls of test tube.	Brown coloured ring is formed.	Nitrate confirmed.

Chemical Equations:-

Ionic equation:-

$$NO_3^- + 3Fe^{2+} + 4H^+ \rightarrow 3Fe^{3+} + NO + 2H_2O$$

$$[Fe(H_2O)_6]^{2+} + NO \rightarrow [Fe(H_2O)_5(NO)]^{2+}$$

ACETATE

Preliminary Test:-

Experiment	Observation	Inference
Added dilute sulphuric acid to given salt.	No effect.	Carbonate, sulphide , sulphite, nitrate absent.
Added concentrated sulphuric acid to given salt.	Vinegar like smell.	Acetate may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added ethanol to the salt, then added drops of concentrated sulphuric acid.	Evolution of fruity smell.	Acetate confirmed.

Chemical Equations:-

Ionic equation:-

$CH_3COOH^- + H_2SO_4 \rightarrow HSO_4^- + CH_3COOH$

OXALATE

Preliminary Test:-

Experiment	Observation	Inference
Added dilute sulphuric acid to given salt.	No effect.	Carbonate, sulphide , sulphite, nitrate absent.
Added concentrated sulphuric acid to given salt.	Colourless gas with brisk effervescence evolved.	Oxalate may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Passed the above evolved gas through lime water .	Lime water turned milky.	Oxalate confirmed.

Chemical Equations:-

$C_2O_4^{2-} + H_2SO_{4(aq)} \rightarrow CO(g) + CO_{2(g)} + H_2O_{(l)} + SO_4^{2-}$

$CO_{2(g)} + Ca(OH)_{2(aq)} \rightarrow CaCO_{3(s)(milky)} + H_2O_{(l)}$

SULPHATE

Preliminary Test:-

Experiment	Observation	Inference
Added dilute sulphuric acid to given salt.	No effect.	Carbonate, sulphide , sulphite, nitrate absent.
Added concentrated sulphuric acid to given salt.	No effect.	Nitrate,Bromide, Chloride,Acetate, absent. Sulphate or phosphate may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added barium chloride solution.	White coloured precipitate is formed.	Sulphate confirmed.

Chemical Equations:-

Ionic equation:-

$Ba^{2+}_{(aq)} + SO_4^{2-}{}_{(aq)} \Longrightarrow BaSO_{4(s)(white)}$

PHOSPHATE

Preliminary Test:-

Experiment	Observation	Inference
Added dilute sulphuric acid to given salt.	No effect.	Carbonate, sulphide , sulphite, nitrate absent.
Added concentrated sulphuric acid to given salt.	No effect.	Nitrate,Bromide, Chloride,Acetate, absent. Sulphate or phosphate may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added soda extract1 and dilute nitric acid and then added Ammonium Molybdate solution.	A canary yellow precipitateformed.	Phosphate confirmed.

Chemical Equations:-

$(NH_4)_2(NO_3)+2Na_2(PO_4) \rightarrow 2(NH_4)(PO_4)+2Na_2(NO_3)$

AMMONIUM

Preliminary Test:-

Experiment	Observation	Inference
Smelled the salt.	Ammonical smell.	Ammonium may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added sodium hydroxide solution to the salt.	Ammonical smelling gas evolved.	Ammonium confirmed.

Chemical Equations:-

Ionic equation:-

$NH_4^+{}_{(aq)} + OH^-{}_{(aq)} \rightarrow NH_{3(g)} + H_2O_{(l)}$

LEAD1

Preliminary Test:-

Experiment	Observation	Inference
Smelled the salt.	No Ammonical smell.	Ammonium absent.
Added dilute hydrochloric acid to original solution.	White coloured precipitate is formed.	Lead(II) may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added potassium iodide.	Yellow coloured precipitate formed.	Lead(II) confirmed.

Chemical Equations:-

Ionic equation:-

$Pb^{2+}_{(aq)} + HCl_{(aq)}$  $PbCl_{2(White)}$

$Pb^{2+}_{(aq)} + 2I^{-}_{(aq)}$  $PbI_{2(s)(Yellow)}$

SILVER

Preliminary Test:-

Experiment	Observation	Inference
Smelled the salt.	No Ammonical smell.	Ammonium absent.
Added dilute hydrochloric acid to original solution.	White coloured precipitate is formed.	Lead(II), Ag(I) may be present.
Added precipitate in hot water.	No effect.	Ag(I) may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added potassium chromate to original solution.	Brick red coloured precipitate formed.	Ag(I) confirmed.

Chemical Equations:-

Ionic equation:-

$Ag^{+} + HCl_{(aq)} \rightarrow AgCl_{(s)(white)} + H^{+}$

$2AgCl_{(s)(white)} + K_2CrO_4 \rightarrow Ag_2CrO_{4(s)(yellow)} + 2KCl_{(aq)}$

LEAD2

Preliminary Test:-

Experiment	Observation	Inference
Smelled the salt.	No Ammonical smell.	Ammonium absent.
Added dilute hydrochloric acid to original solution.	No Effect.	Lead(II)may be present.
Added hydrogen disulphide, hydrochloric acid to original solution.	Black coloured precipitate formed.	Lead(II)may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added potassium iodide to original solution.	Yellow coloured precipitate formed.	Lead(II) confirmed.

Chemical Equations:-

Ionic equation:-

$Pb^{2+} + HCl_{(aq)} \rightarrow PbCl_{2(l)} + 2H^{+}$

$Pb^{2+} + KI_{(aq)} \rightarrow PbI_{2(s)(yellow)} + 2K^{+}$

COPPER

Preliminary Test:-

Experiment	Observation	Inference
Smelled the salt.	No Ammonical smell.	Ammonium absent.
Added dilute hydrochloric acid to original solution.	No Effect.	Lead(II)may be present.
Added hydrogen disulphide, hydrochloric acid to original solution.	Black coloured precipitate formed.	Cu(II) ,Pb(II),As(III) may be present.
Added sodium hydroxide to original solution.	Blue coloured precipitate formed.	Cu(II) may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added ammonium hydroxide to original solution.	Blue coloured precipitate formed.	Cu(II) confirmed.

Chemical Equations:-

Ionic equation:-

$Cu^{2+}_{(aq)} + 2OH^{-}_{(aq)} \rightarrow Cu(OH)_{2(s)(blue)}$

$Cu(OH)_{2(s)} + 4NH_{3(aq)} \rightarrow [Cu(NH_3)_4]^{2+}_{(aq)(blue)} + 2OH^{-}_{(aq)}$

ARSENIC

Preliminary Test:-

Experiment	Observation	Inference
Smelled the salt.	No Ammonical smell.	Ammonium absent.
Added dilute hydrochloric acid to original solution.	No Effect.	Lead(II)may be present.
Added hydrogen disulphide, hydrochloric acid to original solution.	Yellow coloured precipitate formed.	As(III) may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added dilute hydrochloric acid to above solution.	Yellow coloured precipitate formed.	As(III) confirmed.

Chemical Equations:-

Ionic equation:-

$2As^{3+} + 3H_2S_{(g)} \rightarrow As_2S_{3(s)(yellow)} + 6H^+$

$2As_2S_{3(s)(yellow)} + 12HCl_{(l)} \rightarrow 4AsCl_{3(s)(yellow)} + 6H_2S$

IRON

Preliminary Test:-

Experiment	Observation	Inference
Smelled the salt.	No Ammonical smell.	Ammonium absent.
Added dilute hydrochloric acid to original solution.	No Effect.	Lead(II)may be present.
Added hydrogen disulphide, hydrochloric acid to original solution.	No Effect.	Pb(II), Cu(II) , As(III) absent.
Added dilute hydrochloric acid, concentrated nitric acid and boiled solution. Then cooled it and added solid ammonium hydroxide.	Reddish Brown precipitate formed.	Fe(III) may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Dissolved the precipitate formed with hydrochloric . Added potassium sulphocyanide.	Blood red colouration.	Fe (III) confirmed.

Chemical Equations:-

Ionic equation:-

$Fe^{3+}_{(aq)} + 3OH^{-}_{(aq)} \rightarrow Fe(OH)_{3(s)}$ (Reddish Brown)

$Fe^{3+}_{(aq)} + 3HCl_{(l)} \rightarrow FeCl_{3(aq)} + 3H_2O_{(aq)}$

$FeCl_{3(aq)} + 6KCNS_{(aq)} \rightarrow K_3[Fe(CNS)_6]_{(Blood\ Red)} + 3KCl_{(aq)}$

ALUMINIUM

Preliminary Test:-

Experiment	Observation	Inference
Smelled the salt.	No Ammonical smell.	Ammonium absent.
Added dilute hydrochloric acid to original solution.	No Effect.	Lead(II)may be present.
Added hydrogen disulphide, hydrochloric acid to original solution.	No Effect.	Pb(II), Cu(II) , As(III) absent.
Added dilute hydrochloric acid, concentrated nitric acid and boiled solution. Then cooled it and added solid ammonium hydroxide.	Gelatinous white precipitate formed.	Al(III) may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Dissolved the precipitate formed with hydrochloric acid and added drops of blue litmus. Then added ammonium hydroxide till alkaline.	Blue coloured precipitate floated on surface .	Al(III) confirmed.

Chemical Equations:-

Ionic equation:-

$Al^{3+}_{(aq)} + 3OH^{-}_{(aq)} \rightarrow Al(OH)_{3(s)(white)(adsorb\ blue\ colour)}$

$Al^{3+}_{(aq)} + 3HCl_{(l)} \rightarrow AlCl_{3(aq)} + 3H_2O_{(aq)}$

MANGANESE

Preliminary Test:-

Experiment	Observation	Inference
Smelled the salt.	No Ammonical smell.	Ammonium absent.
Added dilute hydrochloric acid to original solution.	No Effect.	Lead(II)may be present.
Added hydrogen disulphide, hydrochloric acid to original solution.	No Effect.	Pb(II), Cu(II) , As(III) absent.
Added dilute hydrochloric acid, concentrated nitric acid and boiled solution. Then cooled it and added solid ammonium hydroxide.	No Effect.	Al(III) ,Fe(III) absent.
Passed Hydrogen disulphide gas through above formed solution.	Flesh(buff) coloured precipitate formed.	Mn (II) may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added lead dioxide to above solution, then added concentrated nitric acid. Boiled it.	Pink Colouration formed.	Mn (II) Confirmed.

Chemical Equations:-

Ionic equation:-

$Mn^{2+} + H_2S_{(aq)} \rightarrow MnS_{(s)(Flesh)} + 2H^+$

$MnS_{(aq)} + 2HCl_{(aq)} \rightarrow MnCl_2 + 2H^+ + S^{2-}$

$2Mn^{2+} + 4H^+ + 5PbO_{2(s)} \rightarrow 2MnO_4^-{}_{(aq)} + 5Pb^{2+}{}_{(aq)} + 2H_2O_{(aq)}$

ZINC

Preliminary Test:-

Experiment	Observation	Inference
Smelled the salt.	No Ammonical smell.	Ammonium absent.
Added dilute hydrochloric acid to original solution.	No Effect.	Lead(II)may be present.
Added hydrogen disulphide, hydrochloric acid to original solution.	No Effect.	Pb(II), Cu(II) , As(III) absent.
Added dilute hydrochloric acid, concentrated nitric acid and boiled solution. Then cooled it and added solid ammonium hydroxide.	No Effect.	Al(III) ,Fe(III) absent.
Passed Hydrogen disulphide gas through above formed solution.	White coloured precipitate formed.	Zn (II) may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Dissolved the precipitate in concentrated hydrochloric acid and boiled it.Added potassium ferrocyanide to it	Bluish white coloured precipitate formed.	Zn (II) Confirmed.

Chemical Equations:-

Ionic equation:-

$Zn^{2+} + H_2S_{(aq)} \rightarrow ZnS_{(s)(White)} + 2H^+$

$ZnS_{(aq)} + 2HCl_{(aq)} \rightarrow ZnCl_2 + 2H^+ + S^{2-}$

$2Zn^{2+} + K_4[Fe(CN)_6] \rightarrow Zn_2[Fe(CN)_6]_{(Bluish\ White)} + 4K^+$

NICKEL

Preliminary Test:-

Experiment	Observation	Inference
Smelled the salt.	No Ammonical smell.	Ammonium absent.
Added dilute hydrochloric acid to original solution.	No Effect.	Lead(II)may be present.
Added hydrogen disulphide, hydrochloric acid to original solution.	No Effect.	Pb(II), Cu(II) , As(III) absent.
Added dilute hydrochloric acid, concentrated nitric acid and boiled solution. Then cooled it and added solid ammonium hydroxide.	No Effect.	Al(III) ,Fe(III) absent.
Passed Hydrogen disulphide gas through above formed solution.	Black coloured precipitate formed.	Co(II) or Ni(II) may be present.
Dissolved the precipitate in aqua regia.Evaporated residue.	Yellow coloured residue remained.	Ni(II) may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Dissolved the yellow residue in water. Added ammonium hydroxide till alkaline then added dimethylglyxoglime solution.	Bright red precipitate formed.	Ni(II) confirmed.

Chemical Equations:-

Ionic equation:-

$Ni^{2+} + H_2S_{(aq)} \rightarrow NiS_{(s)(black)} + 2H^+$

$NiS_{(s)(black)} + 2HCl(aq) + [O] \rightarrow NiCl_{2(aq)} + H_2O_{(l)} + S$

COBALT

Preliminary Test:-

Experiment	Observation	Inference
Smelled the salt.	No Ammonical smell.	Ammonium absent.
Added dilute hydrochloric acid to original solution.	No Effect.	Lead(II)may be present.
Added hydrogen disulphide, hydrochloric acid to original solution.	No Effect.	Pb(II), Cu(II) , As(III) absent.
Added dilute hydrochloric acid, concentrated nitric acid and boiled solution. Then cooled it and added solid ammonium hydroxide.	No Effect.	Al(III) ,Fe(III) absent.
Passed Hydrogen disulphide gas through above formed solution.	Black coloured precipitate formed.	Co(II) or Ni(II) may be present.
Dissolved the precipitate in aqua regia.Evaporated residue.	Blue coloured residue remained.	Co(II) may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Dissolved the blue residue in water.Added ammonium sulphocyanide to it.	Blue coloured layer floated on surface .	Co(II)confirmed.

Chemical Equations:-

Ionic equation:-

$Co^{2+} + H_2S_{(aq)} \rightarrow CoS_{(s)(black)} + 2H^+$

$CoS_{(s)(black)} + 2HCl(aq) + [O] \rightarrow CoCl_{2(aq)} + H_2O_{(l)} + S$

$Co^{2+} + 4KCNS \rightarrow K_2[Co(CNS)_4]_{(blue\ colouration)} + 2K^+$

CALCIUM

Preliminary Test:-

Experiment	Observation	Inference
Smelled the salt.	No Ammonical smell.	Ammonium absent.
Added dilute hydrochloric acid to original solution.	No Effect.	Lead(II)may be present.
Added hydrogen disulphide, hydrochloric acid to original solution.	No Effect.	Pb(II), Cu(II) , As(III) absent.
Added dilute hydrochloric acid, concentrated nitric acid and boiled solution. Then cooled it and added solid ammonium hydroxide.	No Effect.	Al(III) ,Fe(III) absent.
Passed Hydrogen disulphide gas through above formed solution.	No Effect.	Zn (II) ,Mn(II), Ni(II), Co(II) absent.
Added ammonium carbonate to above solution.	White precipitate is formed.	Ba(II), Sr(II), Ca(II) may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Dissolved precipitate in acetic acid and boiled it. Added few drops of ammonium oxalate to above solution and then added ammonium hydroxide.	White precipitate is formed.	Ca(II) Confirmed.

Chemical Equations:-

Ionic equation:-

$Ca^{2+} + (NH_4)_2CO_3$ (aq) $\rightarrow CaCO_{3(s)(white)} + 2NH_4^+{}_{(aq)}$

$CaCO_3(s) + 2CH_3COOH$ (aq) $\rightarrow (CH_3COO)_2Ca + CO_2(g) + H_2O(l)$

$Ca^{2+}{}_{(aq)} + (NH_4)_2C_2O_{4(aq)} \rightarrow CaC_2O_{4(s)(white)} + 2NH_4^+{}_{(aq)}$

BARIUM

Preliminary Test:-

Experiment	Observation	Inference
Smelled the salt.	No Ammonical smell.	Ammonium absent.
Added dilute hydrochloric acid to original solution.	No Effect.	Lead(II)may be present.
Added hydrogen disulphide, hydrochloric acid to original solution.	No Effect.	Pb(II), Cu(II) , As(III) absent.
Added dilute hydrochloric acid, concentrated nitric acid and boiled solution. Then cooled it and added solid ammonium hydroxide.	No Effect.	Al(III) ,Fe(III) absent.
Passed Hydrogen disulphide gas through above formed solution.	No Effect.	Zn (II) ,Mn(II), Ni(II), Co(II) absent.
Added ammonium carbonate to above solution.	White precipitate is formed.	Ba(II), Sr(II), Ca(II) may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Dissolved precipitate in acetic acid and boiled it.Added few drops of potassium chromate to above solution.	Yellow precipitate is formed.	Ba (II) Confirmed.

Chemical Equations:-

Ionic equation:-

$Ba^{2+} + (NH_4)_2CO_3\,(aq) \rightarrow BaCO_{3(s)(white)} + 2NH_4^+(aq)$

$BaCO_3(s) + 2CH_3COOH\,(aq) \rightarrow (CH_3COO)_2Ba + CO_2(g) + H_2O(l)$

$Ba^{2+}_{(aq)} + K_2CrO_{4(aq)} \rightarrow BaCrO_{4(s)(yellow)} + 2K^+$

STRONTIUM

Preliminary Test:-

Experiment	Observation	Inference
Smelled the salt.	No Ammonical smell.	Ammonium absent.
Added dilute hydrochloric acid to original solution.	No Effect.	Lead(II)may be present.
Added hydrogen disulphide, hydrochloric acid to original solution.	No Effect.	Pb(II), Cu(II) , As(III) absent.
Added dilute hydrochloric acid, concentrated nitric acid and boiled solution. Then cooled it and added solid ammonium hydroxide.	No Effect.	Al(III) ,Fe(III) absent.
Passed Hydrogen disulphide gas through above formed solution.	No Effect.	Zn (II) ,Mn(II), Ni(II), Co(II) absent.
Added ammonium carbonate to above solution.	White precipitate is formed.	Ba(II), Sr(II), Ca(II) may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Dissolved precipitate in acetic acid and boiled it. Added few drops of ammonium sulphate to above solution and then added ammonium hydroxide.	White precipitate is formed.	Sr(II) Confirmed.

Chemical Equations:-

Ionic equation:-

$Sr^{2+} + (NH_4)_2CO_3$ (aq) $\rightarrow SrCO_{3(s)(white)} + 2NH_4^+{}_{(aq)}$

$SrCO_3(s) + 2CH_3COOH$ (aq) $\rightarrow (CH_3COO)_2Sr + CO_2(g) + H_2O(l)$

$Sr^{2+}{}_{(aq)} + (NH_4)_2SO_{4(aq)} \rightarrow SrSO_{4(s)(white)} + 2NH_4^+{}_{(aq)}$

MAGNESIUM

Preliminary Test:-

Experiment	Observation	Inference
Smelled the salt.	No Ammonical smell.	Ammonium absent.
Added dilute hydrochloric acid to original solution.	No Effect.	Lead(II)may be present.
Added hydrogen disulphide, hydrochloric acid to original solution.	No Effect.	Pb(II), Cu(II) , As(III) absent.
Added dilute hydrochloric acid, concentrated nitric acid and boiled solution. Then cooled it and added solid ammonium hydroxide.	No Effect.	Al(III) ,Fe(III) absent.
Passed Hydrogen disulphide gas through above formed solution.	No Effect.	Zn (II) ,Mn(II), Ni(II), Co(II) absent.
Added ammonium carbonate to above solution.	No Effect.	Mg (II) may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added ammonium chloride, ammonium hydroxide and disodium hydrogen phosphate to original solution.	White precipitate is formed.	Mg(II) Confirmed.

Chemical Equations:-

Ionic equation:-

$Mg^{2+} + HPO_4^{2-}{}_{(aq)} + NH_4^+(aq) \rightarrow Mg(NH_4)PO_{4(white)} + H^+$

ALCOHOL

Preliminary Test:-

Experiment	Observation	Inference
Added bromine water to solution	No Effect Or Pink colour of Bromine water changed to colourless.	Compound is saturated. Or Compound is unsaturated.

Confirmatory Test:-

Experiment	Observation	Inference
Warmed with acetic acid and a few drops of concentrated sulphuric acid.	Fruity smell is formed.	Alcohol confirmed.

Chemical Equations:-

$R_3C\text{-}CR_3 + Br_2$ ·No Effect

OR

$R_2C{=}CR_2 + Br_2$ · $BrR_2C\text{-}CR_2Br$

$CH_3COOH + ROH$ ·$CH_3COOR + H_2O$

ALDEHYDE

Preliminary Test:-

Experiment	Observation	Inference
Added bromine water to solution	No Effect Or Pink colour of Bromine water changed to colourless.	Compound is saturated. Or Compound is unsaturated.
Added drop of blue Litmus to solution.	No Effect.	Carboxylic Acid and Phenol absent.
Added a few drops 2,4-dinitrophenylhydrazine to the solution.	Yellowish -orange precipitate formed.	Aldehyde or ketone may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added a few drops ofFehling's solution A & B.	Formation Of red colour.	Aldehyde confirmed.

Chemical Equations:-

$R_3C\text{-}CR_3 + Br_2$ ·No Effect

OR

$R_2C{=}CR_2 + Br_2$ · $BrR_2C\text{-}CR_2Br$

$R\text{-}CHO + (NO_2)_2C_6H_3NHNH_2$ · $(NO_2)_2C_6H_3NHN{=}CRH_{(Yellowish\ Orange)} + H_2O$

$RCHO + 2Cu^{2+} + 2H_2O$ ·$RCOOH + Cu_2O_{(Red)} + 4H^+$

AMINE

AIM: To test the presence of amino group in the given organic compound.

PROCEDURE:

S.No	EXPERIMENT	OBSERVATION	INFERENCE
1	LITMUS TEST Organic compound + few drops of red litmus solution.	Red litmus turns blue	Amino group present.
2	SOLUBILITY TEST Organic compound + 1-2 ml of dil.HCl. Shake well.	Organic compound dissolves.	Amino group present
3	CARBYLAMINE TEST Organic compound + $CHCl_3$ + Alc.KOH. Heat	An obnoxious smell is obtained.	Primary amine present.
4	AZO DYE TEST Dissolve organic compound in dil.HCl and cool in ice. Add ice cold $NaNO_2$ solution to it. Mix well. Add ice cold solution of β-naphthol + NaOH.	A red or orange dye is obtained.	Primary aromatic amino group present.

EQUATIONS: (ON BLANK SIDE USING A PENCIL)

1. $R\text{-}NH_2 + HCl \rightarrow R\text{-}\ NH_3^+Cl^-$

   amine amine salt

1. $R\text{-}NH_2 + CHCl_3 + 3KOH \rightarrow R\text{-}\ N\equiv C + 3KCl + 3H_2O$

   Isocyanide

   or

carbylamine

1. $NaNO_2 + HCl \rightarrow HNO_2 + NaCl$

$ArNH_2 + HNO_2 + HCl \rightarrow Ar\text{-}\ N^{+}\equiv N^{-}Cl + 2H_2O$

Aromatic Aryldiazonium chloride

1^0amine (stable between 0- 5^0C)

β- naphthol (**draw structure)** **+** Ar- $N^{+}\equiv N^{-}Cl \rightarrow$ **(draw structure of the azo dye obtained) +** N

RESULT: : *(ON RULED SIDE)* Amino present in the given organic compound.

CARBOXYLIC ACID

Preliminary Test:-

Experiment	Observation	Inference
Added bromine water to solution	No Effect Or Pink colour of Bromine water changed to colourless.	Compound is saturated. Or Compound is unsaturated.
Added drop of blue Litmus to solution.	Solution turned Red.	Carboxylic Acid may be present.

Confirmatory Test:-

Experiment	Observation	Inference
Added sodium bicarbonate to solution.	Gas with brisk effervescence evolved.	Carboxylic acid confirmed.

Chemical Equations:-

$R_3C\text{-}CR_3 + Br_2$ ·No Effect

OR

$R_2C{=}CR_2 + Br_2$ ·$BrR_2C\text{-}CR_2Br$

$RCOOH + NaHCO_3$ ·$RCOONa + H_2O + CO_2$

MISCELLANEOUS

1) TITRATION - MOHR's SALT

2) TITRATION - OXALIC ACID

3) CARBOHYDRATE TEST

4) CHROMATOGRAPHY

5) PREPARE COLLOIDAL FERRIC HYDROCHLORIDE

6) PREPARE COLLOIDAL STARCH

7) OIL FAT TEST

8) PREPARE MOHR's SALT CRYSTALS

9) PREPARE POTASH ALUM CRYSTAL

10) PROTEIN TEST

MOHR's SALT

AIM – (a) To prepare 250ml of M/20 solution of Mohr's salt.

(b) Using this calculate the molarity and strength of the given $KMnO_4$ solution.

APPARATUS AND CHEMICALS REQUIRED- Mohr's salt, weighing bottle, weight box, volumetric flask, funnel, distilled water, chemical balance, dilute H_2SO_4, beakers, conical flask, funnel, burette, pipette, clamp stand, tile, $KMnO_4$ solution.

THEORY- (a) Mohr's salt having the formula $FeSO_4.(NH_4)_2SO_4.6H_2O$ has molar mass $392 gmol^{-1}$. It is a primary standard.

Its equivalent mass is 392/1 = 392 as its *n* factor is 1 as per the following reaction:

$Fe^{2+} \rightarrow Fe^{3+} + e^-$

PROCEDURE:

1. Weigh a clean dry bottle using a chemical balance.
2. Add 4.9g more weights to the pan containing the weights for the weighing bottle.
3. Add Mohr's salt in small amounts to the weighing bottle, so that the pans are balanced.
4. Remove the weighing bottle from the pan.
5. Using a funnel, transfer the Mohr's salt to the volumetric flask.
6. Add about 5ml. of dilute H_2SO_4 to the flask followed by distilled water and dissolve the Mohr's salt.
7. Make up the volume to the required level using distilled water.
8. The standard solution is prepared.

(b) **THEORY**-

1. The reaction between $KMnO_4$ and Mohr's salt is a redox reaction and the titration is therefore called a redox titration.
2. Mohr's salt is the reducing agent and $KMnO_4$ is the oxidizing agent.
3. $KMnO_4$ acts as an oxidizing agent in all the mediums; i.e. acidic, basic and neutral medium.
4. $KMnO_4$ acts as the strongest oxidizing agent in the acidic medium and therefore dil. H_2SO_4 is added to the conical flask before starting the titration.

IONIC EQUATIONS INVOLVED:

Reduction Half: $MnO_4^- + 8H^+ + 5e^- \rightarrow Mn^{2+} + 4H_2O$

Oxidation Half: $5Fe^{2+} \rightarrow 5Fe^{3+} + 5e^-$

Overall Equation: $MnO_4^- + 8H^+ + 5Fe^{2+} \rightarrow Mn^{2+} + 5Fe^{3+} + 4H_2O$

INDICATOR- $KMnO_4$ acts as a self indicator.

END POINT- Colourless to light pink ($KMnO_4$ in the burette)

PROCEDURE-

1. Fill the burette with $KMnO_4$ solution.
2. Pipette out 10ml. of Mohr's salt solution into the conical flask.
3. Add half a test tube of dil. H_2SO_4.
4. Keep a glazed tile under the burette and place the conical flask on it.
5. Note down the initial reading of the burette.
6. Run down the $KMnO_4$ solution into the conical flask drop wise with shaking.
7. Stop the titration when a permanent pink colour is obtained in the solution.
8. This is the end point. Note down the final burette reading.
9. Repeat the experiment until three concordant values are obtained.
10.

OBSERVATION TABLE: ***(TO BE PUT UP ON THE BLANK SIDE USING A PENCIL)***

Volume of Mohr's salt solution taken =

S.No	BURETTE	READINGS	VOLUME OF $KMnO_4$
	INITIAL	FINAL	USED (ml)
1	10	18.8	8.8
2	18.8	27.7	8.9
3	27.7	36.5	8.8

Concordant Value = 8.8mL

CALCULATIONS: *(TO BE PUT UP ON THE BLANK SIDE USING A PENCIL)*

Calculation of amount of Mohr's Salt to be weighed to prepare 100ml M/20 solution:

Molecular Mass of Mohr's Salt = 392g/mole

1000 cm^3 of 1M $KMnO_4$ require 392g Mohr's Salt.

250 cm^3 of M/40 $KMnO_4$ require =392/40g = 4.9g

Using formula:

$N_1M_1V_1 = N_2M_2V_2$

Where N_1=5 (for $KMnO_4$), V_1=8.8mL , M_1 =?

N_2 =1 (for Mohr's salt), V_2 = 10ml, M_2 = 1/20M

M_1 = [1*(1/20)*10]/[5*8.8] = 1/88M = 0.01M

Strength = M X Molar Mass = 158 *(1/88) = 1.79g/L

RESULT- ***(ON RULED SIDE)***- The Molarity of $KMnO_4$ = 0.01M

And the strength of $KMnO_4$ = 1.79g/L

OXALIC ACID

AIM: – (a) To prepare 100ml of M/40 solution of oxalic acid.

(b)Using this calculate the molarity and strength of the given $KMnO_4$ solution.

APPARATUS AND CHEMICALS REQUIRED- Oxalic acid, weighing bottle, weight box, volumetric flask, funnel, distilled water, chemical balance, beakers, conical flask, funnel, burette, pipette, clamp stand, tile, dilute H_2SO_4, $KMnO_4$ solution.

THEORY- (a) Oxalic acid is a dicarboxylic acid having molar mass $126gmol^{-1}$. It is a primary standard and has the molecular formula $COOH\text{-}COOH.2H_2O$. Its equivalent mass is 126/2 = 63 as its *n* factor is 2 as per the following reaction:

$COOH\text{-}COOH \rightarrow 2CO_2 + 2H^+ + 2e^-$.

PROCEDURE:

1. Weigh a clean dry bottle using a chemical balance.
2. Add 3.15g more weights to the pan containing the weights for the weighing bottle.
3. Add oxalic acid in small amounts to the weighing bottle, so that the pans are balanced.
4. Remove the weighing bottle from the pan.
5. Using a funnel, transfer the oxalic acid to the volumetric flask.
6. Add a few drops of distilled water to dissolve the oxalic acid.
7. Make up the volume to the required level using distilled water.
8. The standard solution is prepared.

(b) **THEORY**-

1. The reaction between $KMnO_4$ and oxalic acid is a redox reaction and the titration is therefore called a redox titration.
2. Oxalic acid is the reducing agent and $KMnO_4$ is the oxidizing agent.
3. $KMnO_4$ acts as an oxidizing agent in all the mediums; i.e. acidic, basic and neutral medium.
4. $KMnO_4$ acts as the strongest oxidizing agent in the acidic medium and therefore dil. H_2SO_4 is added to the conical flask before starting the titration.
5. The titration between oxalic acid and $KMnO_4$ is a slow reaction, therefore heat the oxalic acid solution to about 60^0C to increase the rate of the reaction.

IONIC EQUATIONS INVOLVED:

Reduction Half: $MnO_4^- + 8H^+ + 5e^- \rightarrow Mn^{2+} + 4H_2O] \times 2$

Oxidation Half: $C_2O_4^{2-} \rightarrow 2CO_2 + 2e^-$] X 5

Overall Equation: $2MnO_4^- + 16H^+ + 5C_2O_4^{2-} \rightarrow 2Mn^{2+} + 10CO_2 + 8H_2O$

INDICATOR- $KMnO_4$ acts as a self indicator.

END POINT- Colourless to light pink ($KMnO_4$ in the burette)

PROCEDURE-

1. Fill the burette with $KMnO_4$ solution.
2. Pipette out 10ml. of oxalic acid solution into the conical flask.
3. Add half a test tube of dil. H_2SO_4 and heat the solution to about 60^0C to increase the rate of the reaction.
4. Keep a glazed tile under the burette and place the conical flask on it.
5. Note down the initial reading of the burette.
6. Run down the $KMnO_4$ solution into the conical flask drop wise with shaking.
7. Stop the titration when a permanent pink colour is obtained in the solution.
8. This is the end point. Note down the final burette reading.
9. Repeat the experiment until three concordant values are obtained.

OBSERVATION TABLE: ***(TO BE PUT UP ON THE BLANK SIDE USING A PENCIL)***

Volume of Oxalic Acid solution taken = 10mL

S.No	BURETTE	READINGS	VOLUME OF $KMnO_4$
	INITIAL	FINAL	USED (ml)
1	16	26.5	10.5
2	26.5	36.9	10.4

3	36.9	47.4	10.5

Concordant Value = 10.5mL

CALCULATIONS: ***(TO BE PUT UP ON THE BLANK SIDE USING A PENCIL)***

Calculation of amount of oxalic acid to be weighed to prepare 100ml M/20 solution:

Molecular Mass of Oxalic Acid = 126g/mole

1000 cm^3 of 1M oxalic acid require 126g oxalic acid.

1000 cm^3 of M/40 oxalic acid require =126/40g = 3.15g

Using formula:

$N_1M_1V_1 = N_2M_2V_2$

Where N_1=5 (for $KMnO_4$), V_1= 10.5 , M_1 = ?

N_2=2 (for oxalic acid), V_2 = 10ml, M_2 = 1/40

M_1 = [2*(1/40)*10]/[5*10.5] = 1/105M = 0.0095M

Strength = M X Molar Mass = 158 *(1/105) = 1.504g/L

RESULT- ***(ON RULED SIDE)***- The Molarity of $KMnO_4$ = 0.0095M

And the strength of $KMnO_4$ = 1.504g/L

CARBOHYDRATE TEST

AIM: To test the presence of carbohydrate in the given food sample.

PROCEDURE:

S.No	EXPERIMENT	OBSERVATION	INFERENCE
1	CONC H_2SO_4 TEST Food sample + conc. H_2SO_4. Heat	Charring occurs with smell of burnt sugar	Carbohydrate present.
2	MOLISCH'S TEST Food sample + Molisch's reagent (1% alcoholic solution of α naphthol) + conc. H_2SO_4 along the sides of the test tube.	A purple ring is obtained at the junction of the two layers.	Carbohydrate present.
3	BENEDICT'S / FEHLING'S TEST Food sample + Benedict's reagent/ Fehling's reagent (A mixture of equal amounts of Fehling's A and Fehling's B). Heat.	A red ppt. is obtained.	Carbohydrate present.
4	TOLLEN'S TEST Food sample + Tollen's reagent (amm. silver nitrate solution). Heat on water bath.	A silver mirror is obtained the walls of the test tube.	Carbohydrate present.

EQUATIONS: (ON BLANK SIDE USING A PENCIL)

1. $CHO(CHOH)_4CH_2OH + 2Cu^{2+} + 5OH^- \rightarrow COOH(CHOH)_4CH_2OH + Cu_2O + 3H_2O$

Glucose Gluconic acid

2. $CHO(CHOH)_4CH_2OH + 2[Ag(NH_3)_2]^+ + 3OH^- \rightarrow COOH(CHOH)_4CH_2OH + 4NH_3$

Glucose (Gluconic acid) $+ 2Ag \downarrow + 2H_2O$

RESULT: : *(ON RULED SIDE)* The food sample has been tested for carbohydrate.

CHROMATOGRAPHY

AIM: To separate the coloured components present in a mixture of red and blue ink by ascending paper chromatography and find their R_f values.

THEORY: In this type of chromatography a special adsorbent paper (Whatman filter paper) is used. Moisture adsorbed on this Whatman filter paper acts as stationary phase and the solvent acts as the mobile phase**.** The mixture to be separated is spotted at one end of the paper. This paper is then developed in a particular solvent by placing the paper in a gas jar, taking care that the spot is above the solvent. The solvent rises due to capillary action and the components get separated out as they rise up with the solvent at different rates. The developed paper is called a chromatogram.

R_f (retention factor) values are then calculated, which is the ratio of the distance moved by the component to the distance moved by the solvent front.

R_f = Distance traveled by the component

Distance traveled by the solvent front

OBSERVATIONS AND CALCULATIONS: (*ON THE BLANK PAGE, USING A PENCIL)*

S.No	SUBSTANCE	DISTANCE TRAVELLED BY DIFFERENT COMPONENTS	DISTANCE TRAVELLED BY SOLVENT	R_fVALUE
1	RED + BLUE INK			
2	RED + BLUE INK			

RESULT: *(ON RULED SIDE)* - R_f of blue ink =

R_f of red ink =

COLLOIDAL FERRIC HYDROCHLORIDE

AIM: To prepare a colloidal sol of ferric hydroxide.

THEORY: Ferric hydroxide forms a lyophobic sol with water which is the dispersion medium. It is prepared by the hydrolysis of ferric chloride with boiling distilled water as per the reaction:

$FeCl_3$ (aq) + $3H_2O \rightarrow$ $Fe(OH)_3$ + 3HCl (aq).

The HCl formed during the reaction tries to destabilize the sol and therefore should be removed from the sol by dialysis. A wine red sol of ferric hydroxide is obtained.

PROCEDURE:

EXPERIMENT	OBSERVATION	INFERENCE
Take 50 ml of distilled water in a beaker and heat it to about 100^0C. Add the solution of $FeCl_3$to water with stirring.	A wine red sol is obtained	Sol of ferric hydroxide has been prepared

RESULT- Colloidal sol of ferric hydroxide has been prepared.

COLLOIDAL STARCH

AIM: To prepare a colloidal sol of starch.

THEORY: Starch forms a lyophilic sol with water which is the dispersion medium. The sol of starch can be prepared by water to about 100^0C. The sol is quite stable and is not affected by the presence of an electrolytic impurity.

PROCEDURE:

EXPERIMENT	OBSERVATION	INFERENCE
Take 50 ml of distilled water in a beaker and heat it to about 100^0C. Add a thin paste of starch to water with stirring.	A colourless, transluscent sol is obtained	Sol of starch has been prepared

RESULT- Colloidal sol of starch has been prepared.

OIL FAT TEST

AIM: To test the presence of oil or fat in the given food sample.

PROCEDURE:

S.No	EXPERIMENT	OBSERVATION	INFERENCE
1	SOLUBILITY TEST Food sample + water Food sample + chloroform($CHCl_3$)	 Does not dissolve Miscible	 Oil / fat present.
2	SPOT TEST Smear the food sample on paper.	 A translucent spot is observed.	 Oil / fat present.
3	ACROLEIN TEST Food sample + $KHSO_4$. Heat	 An irritating odour is obtained.	 Oil / fat present.

EQUATIONS: (ON BLANK SIDE USING A PENCIL)

Oil/ fat --> glycerol + fatty acid

$CH_2(OH)CH(OH)CH_2(OH) + KHSO_4 \rightarrow CH_2{=}CHCHO$ (acrolein) $+ 2H_2O$

RESULT: ***(ON RULED SIDE)*** The food sample has been tested for oil/fat

MOHR's SALT CRYSTALS

AIM: To prepare crystals of Mohr's salt.

THEORY: Mohr's salt i.e. ferrous ammonium sulphate [$FeSO_4.(NH_4)_2SO_4.6H_2O$] is a double salt. It can be prepared by making equimolar solution of hydrated ferrous sulphate and ammonium sulphate in minimum amount of water. A few ml of dil. H_2SO_4 is added to prevent the hydrolysis of $FeSO_4.7H_2O$. Cooling of the hot saturated solution yields light green crystals of Mohr's salt.

$$FeSO_4.7H_2O + (NH_4)_2\,SO_4 \rightarrow FeSO_4.(NH_4)_2SO_4.6H_2O + H_2O$$

RESULT- Colour of the crystals: Light green

Shape of the crystals: Monoclinic.

POTASH ALUM CRYSTAL

AIM: To prepare crystals of Potash alum.

THEORY: Potash alum, a double salt, commonly known as fitkari has the formula $K_2SO_4.Al_2(SO_4)_3.24H_2O$. It can be prepared by making equimolar solution of potassium sulphate and aluminium sulphate in minimum amount of water. A few ml of dil. H_2SO_4 is added to prevent the hydrolysis of $Al_2(SO_4)_3.18H_2O$. Cooling of the hot saturated solution yields colourless crystals of Potash alum.

$$K_2SO_4 + Al_2(SO_4)_3.18H_2O + 6H_2O \rightarrow K_2SO_4.Al_2(SO_4)_3.24H_2O$$

RESULT- Colour of the crystals: Colourless

Shape of the crystals: Octahedral.

PROTEIN TEST

AIM: To test the presence of protein in the given food sample.

PROCEDURE:

S.No	EXPERIMENT	OBSERVATION	INFERENCE
1	BIURET TEST Food sample + few drops of NaOH + $CuSO_4$ solution.	A violet colouration is obtained.	Protein present.
2	XANTHOPROTEIC TEST Food sample + few drops of conc. HNO_3. Heat.	A yellow ppt. is obtained.	Protein present.
3	NINHYDRIN TEST Food sample + few drops of 0.15 ninhydrin solution. Boil the contents.	A blue colour is obtained.	Protein present.

RESULT: ***(ON RULED SIDE)*** The food sample has been tested for proteins.