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PREPARATION

OF

SOILS

2018 EXPERIMENT NUMBER : 1

PREPARATION OF LYOPHILIC SALT (STARCH SOL)

→ **AIM:**

To prepare colloidal solution of starch.

→ **APPARATUS:**

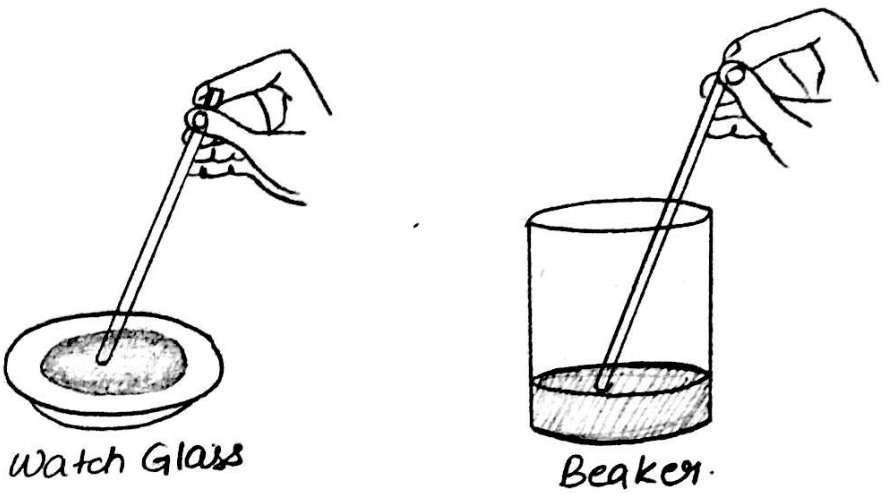
250 ml beaker, watch glass, glass rod, tripod stand, wire gauze, bea

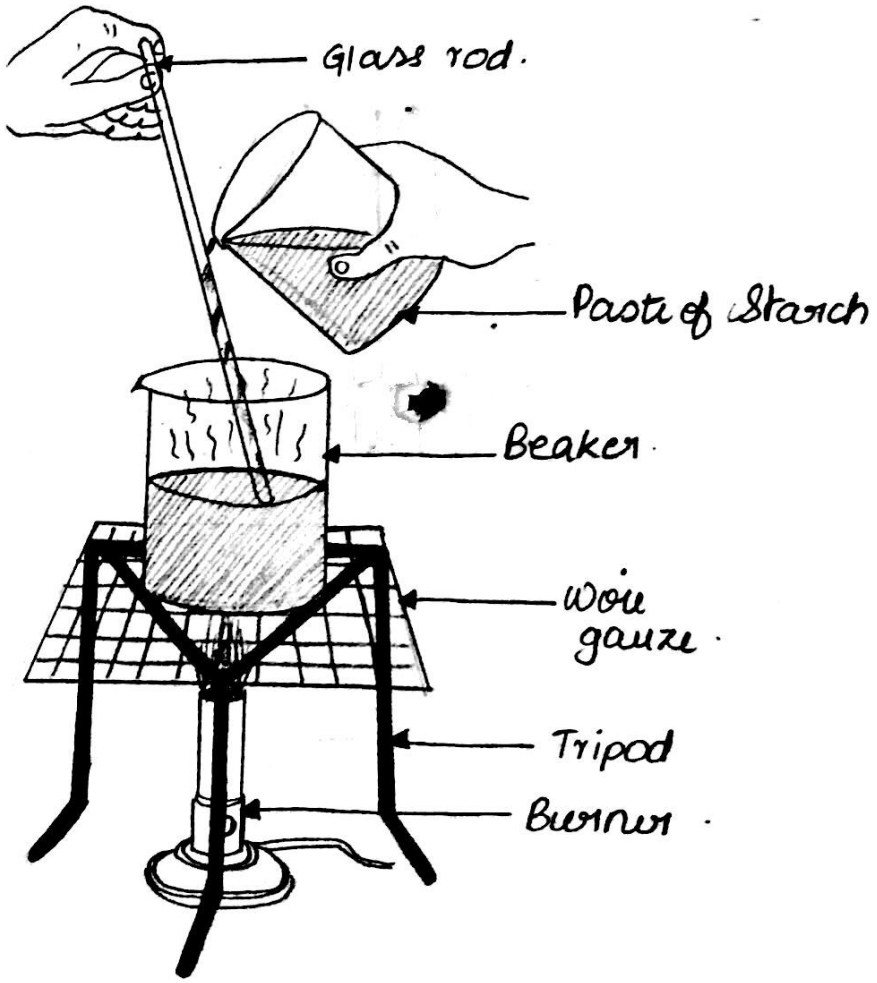
→ **CHEMICALS REQUIRED:**

Starch powder and distilled water.

→ **PROCEDURE:**

1. Make a thin paste of salt with a few ml of water in a watchglass.
2. Transfer the paste to a 250 ml beaker with 185 ml hot water, un starts boiling.
3. While transferring the paste to the boiling water, constant stirring is required using a glass rod.
4. Leave the beaker for cooling.





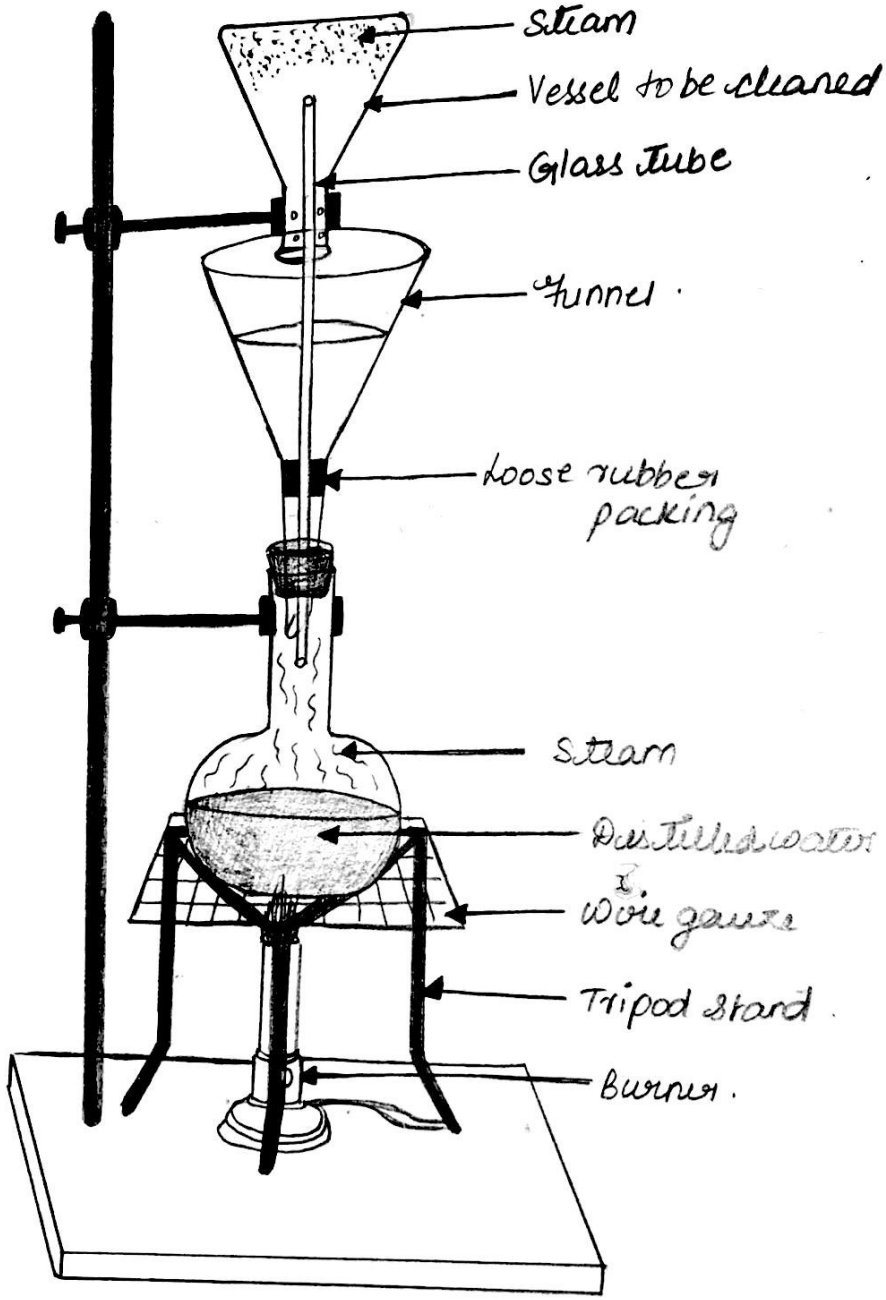
PREPARATION OF STARCH SOL

RESULT:

Starch sol is prepared.

PRECAUTIONS:

1. The apparatus must be cleaned properly before making sol.
2. Starch paste should be added in a thin stream to the boiling water.
3. During preparation of the sol, constant stirring is required.



CLEANING OF THE GLASS APPARATUS.

2012 EXPERIMENT NUMBER: 2

PREPARATION OF LYOPHOBIC SALT.
(FERRIC HYDROXIDE SALT)

→ **AIM:**

To prepare colloidal solution of ferric hydroxide.

→ **APPARATUS AND CHEMICALS REQUIRED:**

Conical flask, 250 ml beaker, glass rod, 2% solution of ferric chloride, distilled water.

→ **THEORY:**

$$FeCl_3 + 3H_2O \xrightarrow{boil} Fe(OH)_3 + 3HCl.$$

→ **PROCEDURE:**

1. Take a 250 ml beaker. Clean it and dry it.
2. Add 100 ml of distilled water to it and heat it to a boil.
3. To the boiling water, add ferric chloride dropwise. Continue heating u deep red solution of ferric hydroxide is obtained.
4. Leave the conical flask undisturbed at room temperature.

→ **RESULT:**

Ferric hydroxide sol is prepared.

→ **PRECAUTIONS:**

1. Since Ferric hydroxide sol is affected by impurities, the apparatus must be cleaned thoroughly.
2. Add Ferric Chloride dropwise.
3. Heating is continued until desired sol is obtained.
4. HCl formed should be removed by dialysis. Otherwise, it would destabilise the colloid.

30/8/14

PREPARATION OF DOUBLE SALT

EXPERIMENT NUMBER : 3.

PREPARATION OF FERROUS AMMONIUM SULPHATE HEXAHYDRATE (MOHR'S SALT).

AIM:

To prepare crystals of ferrous ammonium sulphate hexahydrate (Mohrs salt).

BASIC PRINCIPAL:

Mohr's salt is prepared by dissolving equimolar amounts of hydrated ferrous sulphate and ammonium sulphate in minimum quantity of water containing little dilute sulphuric acid. The resultant solution is filtered to remove impurities and evaporated till crystallization point is reached. Cooling of this hot saturated solution yields light bluish green crystals which are separated from the mother liquor and dried using filter paper.

$$FeSO_4 \cdot 7H_2O + (NH_4)_2SO_4 \longrightarrow FeSO_4(NH_4)_2SO_4 \cdot 6H_2O + H_2O.$$

278 g mol^{-1} 132 g mol^{-1} 392 g mol^{-1}.

APPARATUS REQUIRED:

Two 250 mL beakers, china dish, glass rod, funnel, filter papers, funnel stand, wash bottle, wire gauze or sand bath, tripod stand, Bunsen burner.

CHEMICALS REQUIRED:

14g Ferrous sulphate, 6.5g ammonium sulphate, 5mL dilute sulphuric acid, 50mL distilled water.

→ PROCEDURE:

1. Take 14 g of ferrous sulphate and 6.5 g of ammonium sulphate in a beaker.
2. Take 50 mL of distilled water in another beaker and warm it gently.
3. Add 5 mL of dilute sulphuric acid slowly to the first beaker containing the salts. Mix contents with a glass rod so that the salts are wetted properly (this is to prevent hydrolysis of ferrous sulphate).
4. Add warm water to the above mixture. Stir the contents to dissolve fully.
5. Filter the solution, taking all necessary precautions. The filtrate obtained must be clear, transparent, and light green. Yellow colour indicates oxidation of ferrous salt to ferric state.
6. Check the hot solution for crystallization point.
7. Once crystallization point has been reached, remove the china dish from flame and keep it on cold water in a beaker for cooling, cover with filter paper.
8. To get better quality of crystal growth, seeding may be done.
9. Decant the mother liquor and transfer the crystals to a filter paper sheet. Press it.
10. Observe the colour and shape. Weigh the crystals and report yield.

Result: Colour of the crystals : Light green
Shape of the crystals : Monoclinic.

→ PRECAUTIONS:

1. Use only the green coloured ferrous sulphate. The sample of ferrous sulphate gets oxidised to yellowish ferric sulphate on exposure to air.
2. Remember to add dil. Sulphuric acid before adding water to prevent hydrolysis.
3. Use boiled water for dissolving the salts to minimize oxidation of ferrous ions.
4. Prolonged heating should be avoided, as a fused mass will be obtained.
5. Cooling should be done gradually to get good quality crystals of proper size.

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CHEMICAL KINETICS

EXPERIMENT NUMBER : 4

RATE OF REACTION AGAINST CONCENTRATION.

AIM:

To study the effect of concentration on the rate of reaction between sodium thiosulphate and HCl.

APPARATUS:

Five 250 ml conical flasks, three burettes, 10 ml pipette, stop watch, test tubes.

CHEMICALS REQUIRED:

0.1 M sodium thiosulphate solutions ($Na_2S_2O_3$).
1M hydrochloric acid (HCl)
Distilled water.

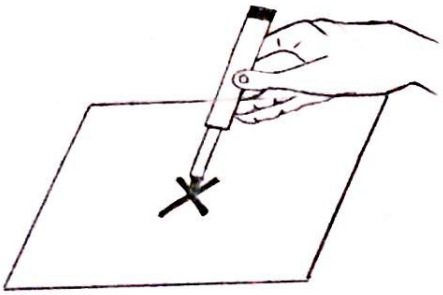
THEORY:

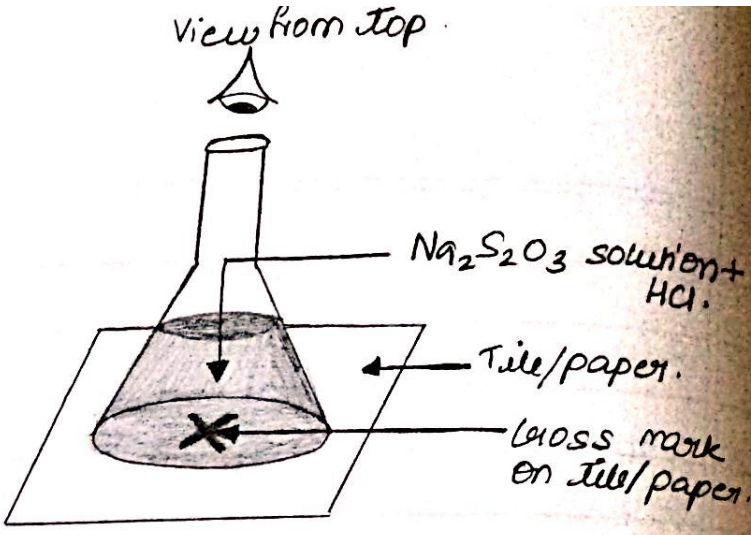
Sodium thiosulphate reacts with hydrochloric acid to form colloidal sulphur along with the evolution of sulphur dioxide.

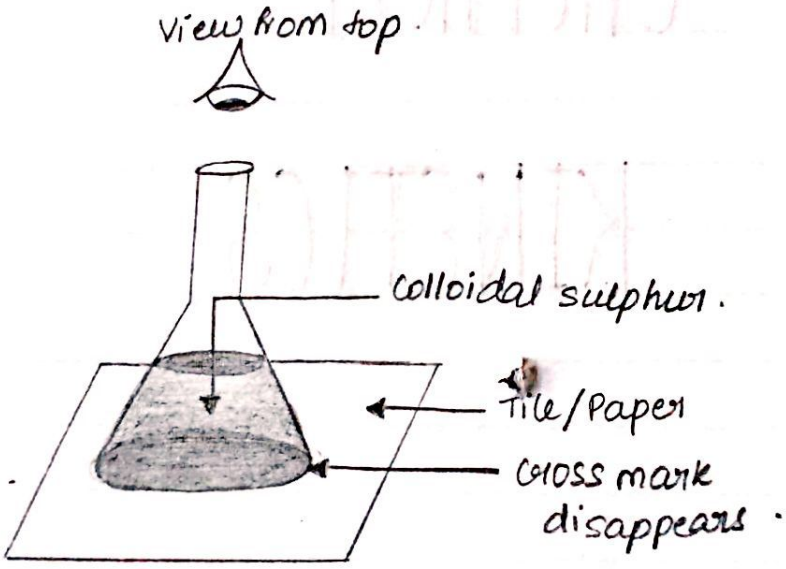
$$Na_2S_2O_3(aq) + 2HCl(aq) \longrightarrow S(s) + 2NaCl(aq) + SO_2(g) + H_2O(l).$$

$$S_2O_3^{2-}(aq) + 2H^+(aq) \longrightarrow S(s) + SO_2(g) + H_2O(l).$$

This colloidal sulphur gives a milky appearance and as the reaction proceeds, a stage is reached when there is enough precipitate of sulphur which makes the solution opaque. The rate of reaction can be followed by measuring the time taken for a reference mark on the tile to become invisible (The reaction flask is kept above the marked tile).







RATE OF REACTION AGAINST CONCENTRATION

PROCEDURE:

(Amount of 1M HCl is constant and amount of 0.1M $Na_2S_2O_3$ is varied)

Wash the five conical flasks with distilled water and label them as 1, 2, 3, 4, 5.

Take three clean burettes and fill them up with 0.1M sodium thiosulphate, 1M HCl and distilled water respectively.

Add 10, 20, 30, 40, and 50 mL of 0.1M $Na_2S_2O_3$ from the burette into the conical flasks labelled 1, 2, 3, 4 and 5.

Now add 40, 30, 20, 10 mL of distilled water from the burette into the flasks 1, 2, 3 and 4 respectively so that the total volume in each flask is 50 mL. (Do not add any water in flask no 5).

Take 5 mL of 1M HCl in a test tube accurately from the burette and keep it in a test tube stand.

Take a white tile and put a cross mark on it.

Keep the conical flask no. 1 on the tile just above the cross mark and view from above. The cross should be visible.

Now quickly add 5 mL of 1M HCl from the test tube into the conical flask and swirl it. Keep it back on the cross mark immediately.

→ OBSERVATION TABLE:

SR.No.	Volume of 0.1M $Na_2S_2O_3$.	Volume of distilled H_2O.	Total Volume	Volume of 1M HCl.	Time taken (s)
1.	10ml	40ml	50ml	5ml	108
2.	20ml	30ml	50ml	5ml	54
3.	30ml	20ml	50ml	5ml	28
4.	40ml	10ml	50ml	5ml	23
5.	50ml	0ml	50ml	5ml	13.8

Simultaneously start the stop watch, when half of the HCl has been added, view the flask from above.

9. Observe the reaction by viewing the solution from top. You will notice the appearance of cloudiness. Then the solution turns milky. Finally the precipitate will form so that the cross is not visible. Stop the stop watch at this time when the cross mark 'just vanishes' from sight. Record the time taken for this to happen in the observation table.

10. Repeat the same procedure by taking of 5 mL of HCl from the burette each time and adding it to the conical flask numbered 2, 3, 4 and 5. Note down the time taken for the cross to disappear (from sight) and enter it in the observation table.

→ RESULT:

Rate of reaction between $Na_2S_2O_3$ and HCl increases with concentration of $Na_2S_2O_3$.

→ PRECAUTIONS:

1. View the cross mark from the top of the conical flask.

2. Start the stop watch immediately with addition of HCl.

04/2013 EXPERIMENT NUMBER : 5

CHROMATOGRAPHY

→ AIM:

To separate the coloured components of blue and red ink by ascending paper chromatography and to find R_f value.

→ APPARATUS AND CHEMICALS:

filter paper strip, mixture of red and blue ink, clips, beaker, ethanol

→ PROCEDURE:

1. Clip a filter paper strip.
2. Draw a line from the centre of paper vertically so that the paper is divided into two equal halves.
3. Draw another horizontal line 2cm from the base.
4. Mark the point of intersection of the two lines as O.
5. Spot the mixture of inks on the point O.
6. Suspend the filter paper vertically using the stand and clip, such that the tip of the paper dips into the solvent ethanol kept

in a beaker.

7. Leave this arrangement undisturbed and note that the solvent starts rising up along with the red and blue ink.

8. When the solvent has risen completely, take the paper out and mark the level of the solvent front.

9. Measure the distance travelled by the red spot, blue spot, and the solvent from the origin O and record your observations.

→ RESULT:

R_f of red ink = 0.906

R_f of blue ink = 0.976.

→ PRECAUTIONS:

1. The ink spot should not dip in the solvent.

2. The ink spot should be small in size.

10/10

→ OBSERVATIONS:

SR. NO.	Colour of spot (ink)	Distance travelled by ink from origin (P) (cm)	Distance travelled by solvent from origin (X) (cm)	Rf ($Rf = \frac{P}{X}$)
1.	Red	7.7	8.5	0.906
2.	Blue	8.3	8.5	0.976

ORGANIC ANALYSIS

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16/05/2013 EXPERIMENT NUMBER: 6.

TEST FOR ALCOHOLIC GROUPS.

EXPERIMENT	OBSERVATION	INFERENCE.
1. CERIC AMMONIUM NITRATE TEST: To the organic compound (aqueous solution), add 1ml of Ceric Ammonium nitrate solution.	Red colouration.	Alcoholic group is present.
2. SODIUM METAL TEST: To 2ml of the organic compound in a clean dry test tube, add a small piece of sodium metal.	Bubbles of hydrogen gas	Alcoholic group is present.
3. ESTER FORMATION TEST: To 1ml of the organic compound in a clean dry test tube, add 1ml of glacial acetic acid and 2 drops of conc: H_2SO_4. Warm the mixture in a water bath for 10-15 minutes. Cool and pour the contents to an aqueous solution of Na_2CO_3 in a beaker. Smell it.	Pleasant fruity smell due to presence of an ester.	Alcoholic group is present.

→ RESULT:

The given organic compound contains alcoholic group.

29/10/14

10/2013 EXPERIMENT NUMBER: 7

TEST FOR PHENOLIC GROUP

	EXPERIMENT	OBSERVATION	INFERENCE
1.	LITMUS TEST: Add 1 drop of the organic compound on a blue litmus paper.	Blue litmus changes to red.	Phenolic group is present.
2.	FERRIC CHLORIDE TEST: To an aqueous solution of the compound, add 1ml of neutral ferric chloride solution.	Violet colouration.	Phenolic group is present.
3.	BROMINE WATER TEST: To the aqueous solution of the organic compound, add bromine water.	White precipitate formed.	Phenolic group is present.

→ RESULT:

The given organic compound contains phenolic group.

20/20
10/14
30/

05/2019 EXRIMENT NUMBER : 8.

TEST FOR ALDEHYDIC GROUP.

	EXPERIMENT	OBSERVATION	INFERENCE.
1.	2,4-DNP TEST: To a little of the organic compound, add 1ml of 2,4-DNP reagent and Shake well.	Red, yellow or orange ppt. formed.	Carbonyl group is present.
2.	TOLLENS TEST: To a few ml of the organic compound, add 1-2 ml of Tollen's Reagent. Shake well and heat it in a water bath for 2-3 minutes.	Silver mirror or grey precipitate formed.	Aldehydic group is present.
3.	FEHLING'S TEST: Mix equal volumes of Fehling's Solution A and B and add a few ml of organic compound into it. Shake well and keep the test tube in a boiling water bath for 2 minutes.	Red precipitate of Cu_2O formed.	Aldehydic group is present.

→ RESULT: Given organic compound contains aldehydic group.

3/6/2019

EXPERIMENT NUMBER : 9

TEST FOR CARBOXYLIC ACID GROUP.

EXPERIMENT	OBSERVATION	INFERENCE.
1. LITMUS TEST: Dip the blue litmus paper into the organic compound	Blue litmus changes to red.	Carboxylic acid group is present.
2. $NaHCO_3$ TEST: To the aqueous solution of the organic compound, add a little $NaHCO_3$ powder.	Brisk effervescence of a colourless, odourless gas which can turn limewater milky.	Carboxylic acid group is present.
3. ESTER FORMATION TEST: To 1ml of the organic compound in a clean dry test tube, add 1ml of ethanol and 2 drops of conc: H_2SO_4. Warm the mixture in a water bath for 10-15 minutes. Cool and pour the contents to an aqueous solution of Na_2CO_3 in a beaker. Smell it.	Pleasant fruity smell due to the presence of an ester.	Carboxylic acid group is present.

→ RESULT: The given compound contains carboxylic acid group.

VOLUMETRIC ANALYSIS

2013 EXPERIMENT NUMBER: 10.

PREPARATION OF STANDARD SOLUTION OF MOHR'S SALT.

→ **AIM:**

To prepare standard solution of $\frac{M}{20}$ ferrous ammonium sulphate.

$\frac{M}{20}$ = 0.05 Molar.

→ **APPARATUS REQUIRED:**

watch glass, beaker, standard flask, funnel, glass rod.

→ **CHEMICALS REQUIRED:**

Mohr's salt (Ferrous Ammonium sulphate hexahydrate), Distilled water, dil: Hydrochloric acid.

→ **CALCULATION OF WEIGHT OF THE SALT:**

Molarity of the solution = 0.05 = M.

weight of Mohr's salt required to make 0.05 Molar Solution = $W = \frac{M \times M_f \times V(mL)}{1000}$.

M_f = 392 g mol^{-1}.

V(mL) = 250 mL.

$\therefore W = \frac{0.05 \times 392 \times 250}{1000}$

$W = 4.9\,g$

$= g$

→ PROCEDURE:

1. Weigh accurately 4.9 g of Mohr's salt crystals on a watch glass.
2. Transfer carefully, the crystals of Mohr's salt to a clean, dry beaker.
3. Add 20 ml of dil: H_2SO_4 to the Mohr's salt in the beaker to prevent hydrolysis of ferrous ions to ferric ions.
4. Add 20 ml of water into the beaker. Dissolve the Mohr's salt completely in the solution.
5. Transfer the solution using glass rod and funnel to a standard flask.
6. Add water to the standard flask to make up the volume to 250 ml.
7. Shake the standard flask well so that the solution becomes homogeneous

→ RESULT:

The standard solution of Mohr's salt is prepared.

20/10/14

2023 EXPERIMENT NUMBER: 11

STANDARDISATION OF $KMnO_4$ USING 0.05M MOHR'S SALT SOLUTION.

→ AIM:

To standardise the given $KMnO_4$ using 0.05M Mohr's Salt solution.

→ APPARATUS REQUIRED:

Burette, pipette, standard flask, conical flask, funnel, glass rod.

→ CHEMICALS REQUIRED:

Mohr's salt, $KMnO_4$, 4N H_2SO_4, distilled water.

→ PRINCIPLE:

1. This is an example of a redox reaction.
2. Acidified $KMnO_4$ is the oxidising agent.
3. Mohr's salt is the reducing agent.
4. $KMnO_4$ is the self indicator.
5. End point is the colour change from colourless to permanent pink.
6. During the reaction, the oxidation state of Mn changes from +7 to +2. The oxidation state of Fe changes from +2 to +3.
7. $KMnO_4$ is in the burette and Mohr's salt is in the conical flask taken by the pipette.

→ EQUATION:

Ionic Equations:

$MnO_4^- + 5Fe^{2+} + 8H^+ \longrightarrow Mn^{2+} + 4H_2O + 5Fe^{3+}$.

Overall Equation: $2KMnO_4 + 10FeSO_4 + 8H_2SO_4 \longrightarrow K_2SO_4 + 2MnSO_4 + 5Fe_2(SO_4)_3 + 8H_2O$.

→ PROCEDURE:

1. Standard solution of 0.05M Mohr's salt is prepared accurately by weighing 4.9g of Mohr's salt using a chemical balance.
2. Rinse the burette with water and then with $KMnO_4$.
3. Fill up the burette with $KMnO_4$.
4. Rinse the pipette with Mohr's salt solution. Pipette out 20mL of mohr's salt solution. Transfer it into the conical flask.
5. Add 10mL of 4N H_2SO_4 into the conical flask to make the medium acidic.
6. Titrate Mohr's salt solution against $KMnO_4$ solution till end point is reached.
7. Note down the initial burette reading and the final burette reading.
8. Repeat the titration till you get concordant value.

→ RESULT:

1. Molarity of $KMnO_4$ = 0.0102 $mol\,L^{-1}$

2. Strength of $KMnO_4$ = 1.611 $g\,L^{-1}$.

→ PRECAUTIONS:

1. The burette & pipette must be washed well.
2. For colourless solutions, lower meniscus must be checked while for coloured solutions, upper meniscus must be considered while measuring the level.

10/14

→ CALCULATION:

Standardisation of $KMnO_4$.

SR. No.	Initial Burette Reading	Final Burette Reading	Volume of $KMnO_4$ (mL)	Volume of Mohr's Salt Soln (mL)
1.	0	19.5	19.5	20
2.	0	19.5	19.5	20

$KMnO_4$ × Mohr's Salt

$$\frac{M_1V_1}{N_1} = \frac{M_2V_2}{N_2}$$

M_1 = Molarity of $KMnO_4$ = ?
V_1 = Volume of $KMnO_4$ used = 19.5mL.
N_1 = No. of moles of $KMnO_4$ = 1.

M_2 = Molarity of Mohr's Salt = 0.05 M
V_2 = Volume of Mohr's Salt used = 20mL
N_2 = No. of moles of Mohr's Salt = 5

$$M_1 = \frac{M_2V_2N_2}{N_2V_1} = \frac{0.05 \times 20 \times 1}{5 \times 19.5}$$

$M_1 = 0.0102$ mol L^{-1}.

Strength or wt/litre of $KMnO_4$:

Strength = M × Molar mass
= 158 g mol^{-1} × 0.0102 mol L^{-1}
= 1.611 g L^{-1}

29/2013 EXPERIMENT NUMBER: 12

PREPARATION OF STANDARD SOLUTION OF OXALIC ACID

→ **AIM:**

To prepare a standard solution of $\frac{M}{40}$ oxalic acid.

$\frac{M}{40} = 0.025M$.

→ **APPARATUS REQUIRED:**

Watch glass, beaker, standard flask, funnel, glass rod.

→ **CHEMICALS REQUIRED:**

Oxalic acid, distilled water.

→ **CALCULATION OF WEIGHT OF THE SALT:**

$Wt = M \times M_r \times V$

$Wt = (90+36) \times \frac{1}{40} \times 250$. $(H_2C_2O_4 \cdot 2H_2O)$

$Wt = \frac{126}{4} \times 25$.

$Wt = 0.7875g$.

→ **PROCEDURE:**

1. Dissolve the oxalic acid in minimum quantity of water in a beaker.
2. Transfer the solution to a standard flask from the beaker using funnel and glass rod. Make the solution to 250ml in the standard flask.

→ RESULT:

$\frac{M}{40}$ oxalic acid solution (250 ml) is prepared.

25/10/14

09/2018 EXPERIMENT NUMBER: 13

STANDARDISATION OF $KMnO_4$ USING 0.025 M OXALIC ACID.

→ **AIM:**

To standardise the given $KMnO_4$ using $\frac{M}{40}$ oxalic acid solution.

→ **APPARATUS REQUIRED:**

Burette, pipette, standard flask, conical flask, funnel, glass rod.

→ **CHEMICALS REQUIRED:**

Oxalic acid, $KMnO_4$ solution, 4N H_2SO_4.

→ **PRINCIPLE:**

1. This is an example of a redox reaction.
2. Acidified $KMnO_4$ is the oxidising agent.
3. Oxalic acid is the reducing agent.
4. $KMnO_4$ is the self-indicator.
5. End point is the colour change from colourless to permanent pink.
6. During the reaction, the oxidation state of Mn changes from +7 to +2. T
   oxidation state of C changes from +3 to +4.
7. $KMnO_4$ is in the burette and oxalic acid is in the conical flask. Ta
   by the pipette.

→ **EQUATION:**

Ionic Equation:

$$2MnO_4^- + 16H^+ + 5C_2O_4^{2-} \longrightarrow 2Mn^{2+} + 8H_2O + 10CO_2$$

Overall Equation: $2KMnO_4 + 5H_2C_2O_4 + 3H_2SO_4 \rightarrow K_2SO_4 + 2MnSO_4 + 10CO_2$

→ PROCEDURE:

1. Prepare a standard solution of 0.025 M oxalic acid by accurately weighing 0.7875 g of oxalic acid using a chemical balance.
2. Fill the burette with $KMnO_4$ after rinsing well.
3. Pipette out 20 mL of oxalic acid from the standard flask to the conical fla
4. Add 1 test tube full of 4N H_2SO_4 into the oxalic acid solution of the conical flask.
5. Heat the solution in the conical flask to 60–70°C
6. Titrate the hot solution of oxalic acid against the $KMnO_4$ till end point is reached [colourless to permanent pink].

→ RESULT:

1. Molarity of $KMnO_4$ = 0.0102 mol L^{-1}.
2. Strength of $KMnO_4$ = 1.611 g L^{-1}.

→ PRECAUTIONS:

1. The burette and pipette must be washed well.
2. For colourless solution, lower meniscus must be considered while for coloured solutions, upper meniscus must be considered while measuring the level of liquid.

30/10/22

→ OBSERVATION AND CALCULATION:

SR. No.	Initial Burette Reading	Final Burette Reading	Volume of KMnO4 (mL)	Volume of Oxalic acid so
1.	0	19.5	19.5	20
2.	0	19.5	19.5	20.

$$KMnO_4 \quad \times \quad \text{Oxalic Acid}$$

$$\frac{M_1V_1}{N_1} = \frac{M_2V_2}{N_2}$$

M_1 = Molarity of $KMnO_4$ = ?
V_1 = Volume of $KMnO_4$ = 19.5mL
N_1 = No. of moles of $KMnO_4$ = 2.

M_2 = Molarity of Oxalic Acid = $\frac{M}{40}$ = 0.025
V_2 = Volume of oxalic acid = 20mL
N_2 = No. of moles of oxalic acid = 5.

$$M_1 = \frac{M_2V_2N_1}{N_2V_1}$$

$$M_1 = \frac{0.025 \times 20 \times 2}{5 \times 19.5}$$

$$M_1 = 0.0102$$

Strength or wt/Litre of $KMnO_4$:

$$M = \frac{Wt}{M_r \times V} \implies \frac{Wt}{V} = M \times M_r.$$

Strength = $0.0102 \text{ mol } L^{-1} \times 158 g L^{-1}$
= $1.611 \ g L^{-1}$

INORGANIC QUALITATIVE ANALYSIS

→ PRELIMINARY TESTS:

	EXPERIMENT	OBSERVATION	INFERENCE.
1.	Colour and appearance.	Colourless, crystalline salt.	absence of Cu^{2+}, Mn^{2+}.
2.	Odour	Slight smell of ammonia	NH_4^+ may be present.
3.	Solubility	Soluble in water.	No need to make Na_2CO_3 extract.
4.	Flame Test: make a paste of a little salt in conc: HCl. Introduce it to a flame on a platinum loop.	No observation	absence of Ca^{2+}, Cu^{2+}, Ba^{2+}, Sr^{2+}.

	EXPERIMENT	OBSERVATION	INFERENCE.
5.	Dry Heating: Take a little salt in a dry test tube and heat it directly over a flame.	Strong smell of ammonia. White sublimate.	NH_4^+ may be present.

→ TEST FOR ANIONS:

	EXPERIMENT	OBSERVATION	INFERENCE.
	TEST FOR CO_3^{2-} To a little of the salt, add a few drops of dil: H_2SO_4	No characteristic observation.	CO_3^{2-} is absent.
2.	TEST FOR CH_3COO^- To a little of the salt, add a few drops of conc: H_2SO_4	No characteristic observations	CH_3COO^- is absent.
3.	TEST FOR HALIDES:		

a few drops of conc: H_2SO_4

	To a little of the salt, add a few drops of conc: H_2SO_4.	No characteristic observations.	Cl^-, Br^-, I^- are absent.
4.	TEST FOR NO_3^-: To a little of the salt, add a few drops of conc: H_2SO_4 and heat. Add a small paper ball to it and heat again	No characteristic observations.	NO_3^- is absent.
5.	TEST FOR SO_4^{2-} To a little of the salt solution, add a little $BaCl_2$ solution.	No characteristic observations	SO_4^{2-} is absent.
6.	TEST FOR PO_4^{3-} To a little of the salt, add conc: HNO_3. Heat, add powdered Ammonium Molybdate and heat again.	Canary yellow precipitate	PO_4^{3-} is present.

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CONFIRMATION TEST FOR PO_4^{3-}

EXPERIMENT	OBSERVATION	INFERENCE.
To a little of the salt, add cobalt nitrate solution	Violet ppt soluble in dil: CH_3COOH.	PO_4^{3-} is confirmed.

RESULT: The given salt has PO_4^{3-} as anion.

→ TEST FOR CATIONS:

EXPERIMENT	OBSERVATION	INFERENCE.
GROUP 0 ELEMENTS.		
TEST FOR NH_4^+. To a little of the salt, add NaOH solution and heat.	Smell of ammonia.	NH_4^+ may be present.

CONFIRMATION TEST FOR NH_4^+.

To a little of the salt solution, add a little Nessler's Reagent.	Camel brown precipitate obtained.	NH_4^+ is confirmed.
To a little of the salt solution, add a little Na_2CO_3 solution.	No precipitation.	NH_4^+ is confirmed.

RESULT: The given salt has NH_4^+ as cation.

CONCLUSION: The given salt is Ammonium Phosphate, $(NH_4)_3PO_4$.

30/5/13