Chemistry chart

Department of Chemistry (H.S.S)

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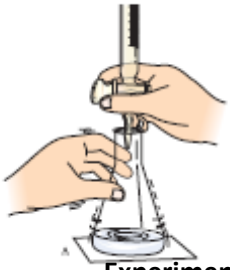


VOLUMETRIC ANALYSIS

REDOX TITRATIONS

Experiment No:- 1 Date:----------

Aim:- You are provided with two solutions as follows.

Container A: ----------**M/N** Stock Solution of Hydrated Mohr's Salt.

Container B: - **$KMnO_4$** Solution.

Using the Stock Solution from container **A** Prepare 100 ml of _____ M/N Solution of Mohr's Salt in the given standard measuring flask **C.**

Using the solution in flask C determine the

1. Molarity/Normality of the solution in container B.
2. Strength of less /more concentrated solution in container B/C in terms of gms/_____ ml.
3. % Purity of Solution in Container B (-----Gms of which have been dissolved per-------ml)

Procedure:

1. Rinse the pipette with the _____ N/M Mohr's Salt solution and pipette out 10 ml of it in a washed titration flask.
2. Rinse and fill the burette with the given $KMn0_4$ solution.
3. Add one test-tube (15 ml) full of dilute sulphuric acid (2 N) to the solution in the titration flask.
4. Note the initial reading of the burette.
5. Add $KMn0_4$ solution from the burette till a permanent light pink colour is imparted to the solution in the titration flask on addition of the last single drop of $KMn0_4$ solution.
6. Note the final reading of the burette.
7. Repeat the above steps to get three concordant readings.

Result:

Solution	Normality	Molarity	Strength	% Purity
	---------N	..... M	..... gms	.....
$KMnO_4$	---------N	..... M	..... gms	

_____Solution is Less/More Concentrated in terms of Normality/Molarity.

1. Given:-
2. To prepare:
3. To find:

Observations:

1. Solution in Burette : $KMn0_4$solution.
2. Pipette Solution: Mohr's Salt Solution
3. Solution in Flask: 10 ml of ------ N /M Mohr's Salt+ 1test tube di!. H_2SO_4,
4. Indicator: $KMn0_4$ acts as self indicator.
5. End point: Colourless to light pink.

Chemical equations:

$$2KMnO_4 + 8H_2SO_4 + 10FeSO_4\,(NH_4)_2\,SO_4 . 6H_2O \longrightarrow K_2SO_4 + 2MnSO_4 + 5Fe_2(SO_4)_3 + 10(NH_4)_2SO_4 + 68H_2O$$

Observation Table: Pilot Reading_____ml To _____ml.

Burette Reading	**I**	**II**	**III**	**Constant Burette Reading (C.B.R.)**
Final	... mL	.... mL	..... mL	..... mL
Initial	O.OmL	O.OmL	O.OmL	
Difference	.... mL	..... mL	..... mL	

Calculations:

1. To calculate volume required to prepare 100 ml of ----------N/M_____Solution

Solution to be prepared=Stock Solution

$$N_1V_1=N_2V_2$$

2. To calculate Normality of : $KMn0_4$solution = $\mathbf{N_1V_1=N_2V_2}$
3. To calculate Grams per -----ml =N X Eq.Wt X ----------/1000
4. To calculate % Purity

$$\%\ \text{Purity} = \frac{\text{Gms/ml of pure } KMn0_4\text{solution } \textbf{(calculated)}}{\text{Gms/ml of Impure } KMn0_4\text{solution } \textbf{(Given)}} \times 100$$

REDOX TITRATIONS

Experiment No:- 2 Date:----------

Aim:- You are provided with two solutions as follows.

Container A: ----------**M/N** Stock Solution of Hydrated Oxalic Acid

Container B: - **$KMnO_4$** Solution.

Using the Stock Solution from container **A** Prepare 100 ml of _____ M/N Solution of Hydrated Oxalic Acid in the given standard measuring flask **C.**

Using the solution in flask C determine the

1. Molarity/Normality of the solution in container B.
2. Strength of less /more concentrated solution in container B/C in terms of gms/_____ ml.
3. % Purity of Solution in Container B (-----Gms of which have been dissolved per-------ml)

Procedure:

1. Rinse the pipette with the _____ N/M oxalic acid solution and pipette out 10 ml of it in a washed titration flask.
2. Rinse and fill the burette with the given $KMn0_4$ solution.
3. Add one test-tube (15 ml) full of dilute sulphuric acid (2 N) to the solution in the titration flask.
4. Note the initial reading of the burette.
5. Heat the flask to 60 -70 °C and add $KMn0_4$ solution from the burette till a permanent light pink colour is imparted to the solution in the titration flask on addition of the last single drop of $KMn0_4$ solution.
6. Note the final reading of the burette.
7. Repeat the above steps to get three concordant readings.

Result:

Solution	Normality	Molarity	Strength	% Purity
	---------N	**..... M**	**..... gms**	**.....**
$KMnO_4$	---------N	**..... M**	**..... gms**	

_____Solution is Less/More Concentrated in terms of Normality/Molarity.

1. Given:-
2. To prepare:
3. To find:

Observations:

1. Solution in Burette : $KMn0_4$solution.
2. Pipette Solution: Oxalic acid
3. Solution in Flask: 10 ml of ------ N /M Oxalic acid + 1test tube di!. H_2SO_4, & Heat.
4. Indicator: $KMn0_4$ acts as self indicator.
5. End point: Colourless to light pink.

Chemical equations:

$$2KMnO_4 + 3H_2SO_4 + 5H_2C_2O_4 \longrightarrow K_2SO_4 + 2MnSO_4 + 8H_2O + 10\,CO_2$$

Observation Table: Pilot reading_____ml To _____ml.

Burette Reading	**I**	**II**	**III**	**Constant Burette Reading (C.B.R.)**
Final	... mL	.... mL	..... mL	..... mL
Initial	O.OmL	O.OmL	O.OmL	
Difference	.... mL	..... mL	..... mL	

Calculations:

1. To calculate volume required to prepare 100 ml of ----------N/M_____Solution

   Solution to be prepared=Stock Solution

   $$N_1V_1=N_2V_2$$

2. To calculate Normality of : $KMn0_4$solution

   $$N_1V_1=N_2V_2$$

3. To calculate Grams per -----ml =N x Eq.Wt X ----------/1000
4. To calculate % Purity

$$\%\ \text{Purity} = \frac{\text{Gms/ml of pure } KMn0_4\text{solution } \textbf{(calculated)}}{\text{Gms/ml of Impure } KMn0_4\text{solution } \textbf{(Given)}} \times 100$$

Note:

1. To calculate Molarity of : $KMn0_4$solution 1M=5N

(To convert from Normality to Molarity divide Normality by five & To convert from Molarity to Normality Multiply Molarity by five.)

2. To calculate Molarity of : Oxalic Acidsolution 1M=2N

(To convert from Normality to Molarity divide Normality by two & To convert from Molarity to Normality Multiply Molarity by two.)

3. To calculate Molarity of : F.A.S solution 1M=1N ie Molarity=Normality

Additional Information:

The acid used in this titration is dilute sulphuric acid. Nitric acid is not used as it is itself an oxidising agent and hydrochloric acid is usually avoided because it reacts with $KMnO_4$ according to the equation given below to produce chlorine and chlorine which is also an oxidising agent in the aqueous solution.

$$2KMnO_4 + 16\ HCl \longrightarrow 2KCl + 2\ MnCl_2 + 5Cl_2 + 8\ H_2O$$

In the titration of $KMn0_4$ V/S Oxalic acid

B. Ionic equation

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

Oxidation half reaction : $C_2O_4^- \longrightarrow 2CO_2 + 2e^-] \times 5$

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

In these equations, MnO_4^- is reduced to Mn^{2+} and $C_2O_4^{2-}$ is oxidised to CO_2. The oxidation number of carbon in $C_2O_4^{2-}$ changes from +3 to +4.

- During the titration of oxalic acid against potassium permanganate, warming of oxalic acid solution (50°–60°C) along with dilute H_2SO_4 is required. This is essential because the reaction takes place at higher temperature. During the titration, first manganous sulphate is formed which acts as a catalyst for the reduction of $KMnO_4$ by oxalic acid. Therefore, in the beginning the reaction rate is slow and as the reaction proceeds, the rate of the reaction increases.

- **In the titration of $KMnO_4$ V/S Mohr's Salt**

(b) Ionic equation

Reduction half reaction : $MnO_4^- + 5e^- + 8H^+ \longrightarrow Mn^{2+} + 4H_2O$

Oxidation half reaction : $Fe^{2+} \longrightarrow Fe^{3+} + e^-] \times 5$

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

- The oxidation number of iron in Mohr's salt is +2. Iron is oxidised during the reaction and its oxidation number changes from +2 to +3.

- In the titration of $KMnO_4$ V/S ferrous ammonium sulphate heating of ferrous ammonium sulphate solution is not required because reaction rate is very high even at room temperature. Also, at high temperatures, ferrous ions may be oxidised to ferric ions by oxygen of air and error may be introduced in the experiment.

Precautions

(a) Always rinse the burette and the pipette with the solutions to be taken in them.
(b) Never rinse the conical flask with the experimental solutions.
(c) Remove the air gaps if any, from the burette.
(d) Never forget to remove the funnel from the burette before noting the initial reading of the burette.
(e) No drop of the liquid should hang at the tip of the burette at the end point and while noting reading.
(f) Always read the upper meniscus for recording the burette reading in the case of all coloured solutions.
(g) Never use pipette and burette with a broken nozzle.
(h) Lower end of the pipette should always remain dipped in the liquid while sucking the liquid.
(i) Do not blow out the last drop of the solution from the jet end of the pipette.
(j) The strength of the solution must be calculated up to the fourth decimal place.
(k) Do not forget to heat the mixture of oxalic acid and H2SO4 solutions between 50°–60° C while titrating it against potassium permanganate.

Discussion Questions???

(i) What specific name is given to the permanganate titrations?
(ii) Which indicator is used in the permanganate titration?
(iii) Why is a burette with pinch-cock regulator not used for the permanganate titration?
(iv) Why do we heat oxalic acid solution containing sulphuric acid up to 50–60°C in the permanganate titration?

PHYSICAL EXPERIMENTS

EXPERIMENT NO. 1

Aim: To prepare lyophilic sol of starch.

Apparatus: 250-ml beaker, funnel, glass rod, filter paper, tripod Stand, wire gauze, etc.

Materials required: Soluble starch and water.

Theory: Starch forms a hydrophilic sol when water is used as dispersion medium. The formation of sol is accelerated by heating. The starch sol is prepared by heating starch and water at about 100^{o} C and is quite stable.

Procedure:

1. About 1 gm of starch is taken on a watch glass.
2. The paste of starch is prepared and transferred to a 250-ml beaker.
3. Water (125ml) taken in a beaker is heated so that it starts boiling.
4. The paste is slowly poured with stirring into this boiling water in the beaker.
5. Boiling is continued for about 2-3 minutes and the beaker is allowed to cool.
6. The contents of the beaker are filtered through a filter paper in the funnel.

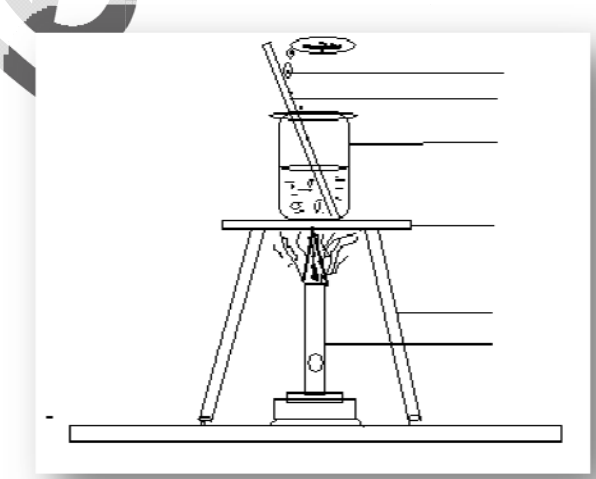
Precautions:

1. The apparatus used for preparing sol should be cleaned properly.
2. Starch should be converted into a fine paste before adding to boiling water.
3. It is necessary to constantly stir the contents during preparation of sol.

RESULT: The colloidal sol of starch is prepared from the given starch powder.

(On L.H.S of Journal)

Diagram:



EXPERIMENT NO. 2

Aim: To determine the enthalpy of neutralization of Hydrochloric acid with Sodium hydroxide solution.

Apparatus: a wide mouth polythene bottle, a rubber cork having two holes, thermometer ($1 / 10^{th}$ degree), stirrer, 100ml measuring cylinder, etc.

Materials required: 0.5M Hydrochloric acid, 0.5M Sodium hydroxide solution.

Theory: Heat is evolved during neutralization of an acid with an alkali. Enthalpy of neutralization is heat evolved when one gram equivalent of the acid is neutralized completely by a base in dilute solution. Enthalpy of neutralization is calculated by mixing known volume or standard solutions of acid and alkali and observing change in temperature.

Procedure:

1. After washing rinse the measuring cylinder with 0.5M NaOH solution.
2. Measure exactly 50ml of 0.5M NaOH in measuring cylinder and transfer it to the clean polythene bottle.
3. Note down the initial temperature of the alkali in the polythene bottle.
4. After washing, rinse the measuring cylinder with 0.5M HCl.
5. Measure exactly 50ml of 0.5M HCl and transfer it to a clean and dry 250ml beaker.
6. Note down the initial temperature of HCl.
7. Add all the HCl solution to the polythene bottle and shake the mixture well.
8. Note down immediately the maximum temperature reached.

Observations:

1. The initial temperature of NaOH t_1=_____ ^oC
2. The initial temperature of HCl t_2= _____ ^oC
3. The final temperature of the mixture t_3= _____ ^oC

Calculations:

1. Heat evolved by neutralization = Heat gained by NaOH + Heat gained by HCl+ heat gained by Polythene bottle.

Heat gained by NaOH = $\underline{\text{Volume of NaOH*Sp Heat of NaOH Soln x } (t_3-t_1)}$

Heat gained by HCl = $\underline{\text{Volume of HCl *Sp Heat of HCl Soln x } (t_3-t_2)} + \underline{W \text{ x } (t_3-t_2)}$

Heat gained by Polythene bottle = W x (t_3-t_2)

W= heat gained by polythene bottle

Heat evolved by neutralization = 50 x 1x (t_3-t_1) + 50 x 1 x (t_3-t_2) +W x (t_3-t_2)

= 50 [(t_3-t_1) + (t_3-t_2) + 0]

(Heat gained by polythene bottle is assumed to be zero) ie W=0)

= Q cals.

Note: Sp Heat of NaOH Soln & Sp Heat of HCl Soln is taken as unity for simplification.

1. When 50ml of 0.5M HCl is neutralised, heat evolved is **Q** cals.
2. Therefore When 100ml of 0.5M HCl is neutralised, heat evolved is **2Q** cals.
3. Therefore When 100ml of 1M HCl is neutralised, heat evolved is **2** x **2** x **Q** cals.
4. Therefore When 1000ml of 1M HCl is neutralised, heat evolved is **10** x **2** x **2** x **Q** cals.

====**40 Q** Cals.

= 40Q/ 1000 Kcals.

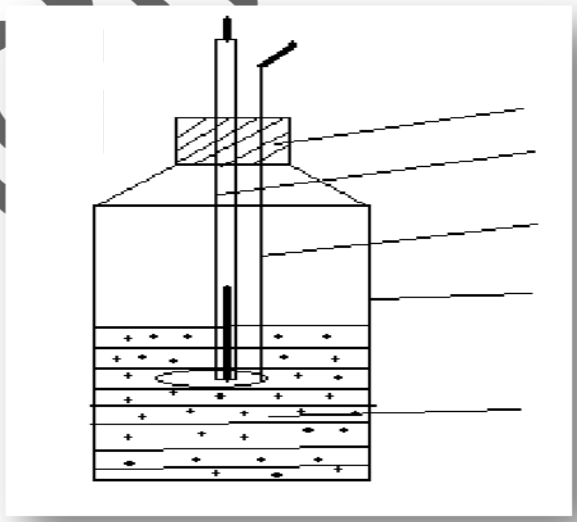
= 0.04Q Kcals.

= -ve ---------- Kcals.

Note -ve sign because it is Exothermic Reaction.

Result: The heat of neutralization of HCl and NaOH is found to be_--_____ Kcals.

Diagram :



EXPERIMENT- 3

Aim: - To study the effect of concentration on the rate of reaction between Sodium thiosulphate and hydrochloric acid.

Apparatus: - 10ml pipette, stop watch, two burettes and five 100ml conical flasks.

Materials required: - 0.1M $Na_2S_2O_3$ solution and 1M HCL solution.

Theory:- According to law of mass action, rate of a chemical reaction is directly proportional to product of the molar concentration of the reactants. In other words the rate of reaction increases with increase in the conc. of the reactants. The effect of concentration of reactants on rate of a reaction between sodium thiosulphate and hydrochloric acid.

$$Na_2S_2O_3 + 2HCl \rightarrow S_{(s)} + 2NaCl_{(aq)} + SO_{2\,(l)} + H_2O_{(l)}$$

The insoluble sulphur formed during the reaction gives a milky appearance and makes the solution opaque. Therefore rate of reaction can be studied by measuring the time taken to produce enough sulphur to make some mark invisible on paper kept under the conical flask in which the reaction is carried out.

Procedure: -

1) Wash the conical flask with water and label them as 1,2,3,4 and 5 respectively.
2) With the help of a burette add 10,20,30,40,50ml of 0.1M $Na_2S_2O_3$ solution to flask 1,2,3,4 and 5.
3) Now add 40,30,20 and 10ml of water to flask 1,2,3 and 4 respectively so that volume of solution in each flask is 50ml.
4) Take 10ml HCL in a test tube with the help of burette.
5) Add 10ml of hydrochloric acid taken in test tube to conical flask no 1 containing 0.1 M $Na_2S_2O_3$ and 40 ml of water and start stop watch. Shake the contents of the conical flask and place it on the tile with a cross mark.
6) Go on observing from top to downwards in the flask and note down the time from the stop watch when the cross mark just becomes invisible.

7) Repeat the above steps by adding 10ml of 1M HCl to flask 2, 3, 4, and 5 and record the time taken in each case for the cross to become just invisible.

Precautions: -

1) *The apparatus must be thoroughly clean. If the same conical flask is to be used again and again, it should be thoroughly washed with cone. HNO_3 and then with water.*
2) *Measures the volume of sodium thiosulphate solution hydrochloric acid and distilled water very accurately.*
3) *Use the same tile with the same cross mark for all observations.*
4) *Complete the experiment at one time only so that there is not much temperature variation.*
5) *Start the stopwatch immediately after adding HCl to sodium thiosulphate solution.*
6) *View the cross mark through the reaction mixture from top to bottom for all observation.*

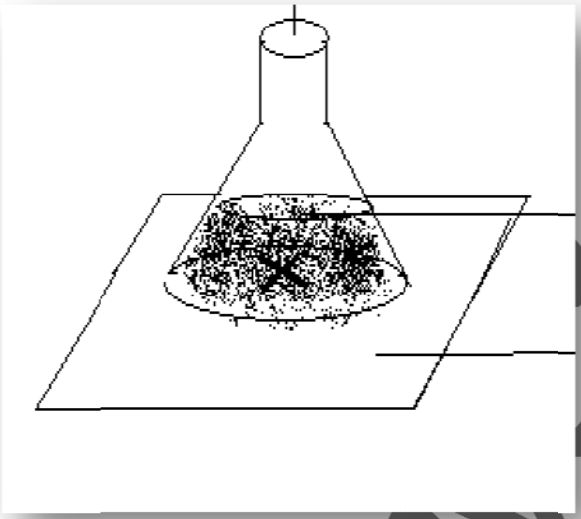
Source of Error:- The conical flask may contain some solution left out due to which the time reading may change.

Result: - The graph between l/t v/s volume of $Na_2S_2O_3$ Or Concn of $Na_2S_2O_3$ is straight line. As concentration of $Na_2S_2O_3$ increases, the rate of the reaction increases.

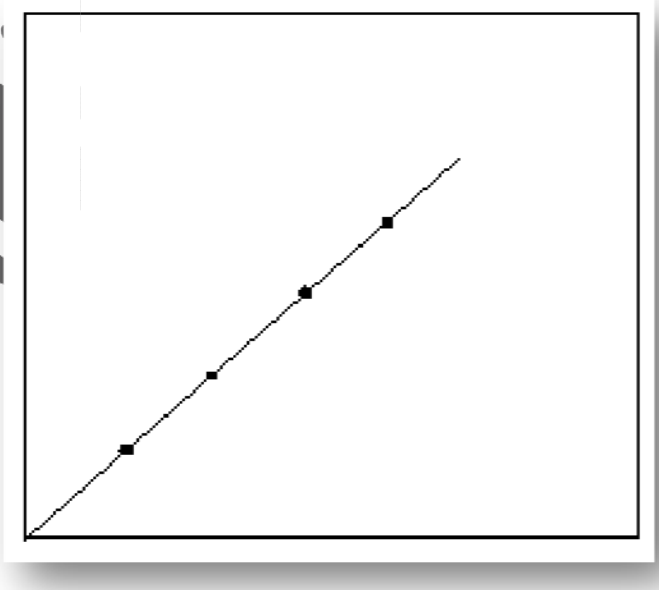
Sr No	Amount of $Na_2S_2O_3$ in ml	Amount of water in ml	Initial Concentration of $Na_2S_2O_3$ in M	Time (t) in Sec	1/t Sec^{-1}
1					
2					
3					
4					
5					

Observation Table:

Diagram:



Graph: Plot a Graph of l/t v/s volume of $Na_2S_2O_3$ Or Concn of $Na_2S_2O_3$



EXPERIMENT NO. 4

Aim: To compare the effectiveness of a number of emulsifying agents in forming emulsion.

Apparatus: Three stoppered bottles, measuring cylinder, stop watch, 5ml pipettes, etc.

Theory: Emulsion obtained by shaking oil with water vigorously or vise-versa is not stable and separates into two layers on standing. For stability of an emulsion, a substance known as emulsifying agent (or emulsifier) is added which reduces the interfacial tension between the dispersed phase and dispersion medium. Different emulsifying agents possess different emulsifying capacities.

Procedure:

1. Take 3 stoppered bottles and labeled them as 1,2, and 3.
2. Add 5ml of coconut oil in each of the 3 bottles 1,2, and 3.
3. Using measuring cylinder take 50ml of distilled water in each bottle.
4. Then add 5 drops of each of 1% soap solution, detergent solution and gelatin solution to bottle number 1,2, and 3 respectively.
5. Take bottle number 1 and shake it *vigorously for 1 minute* and allow it to stand. Note the time taken for separation of the two layers.
6. Repeat the step 5 with bottle number 2 and,3
7. Note down the time taken for the two layers to separate out in each case.
8. Record the observations.

The emulsifying agent which keeps the emulsion stable for the longest time is most effective.

Precautions:

1. Shaking of the contents should vigorous and equal in each case.
2. The time should be recorded carefully.

RESULT: From the observation it is inferred that effectiveness of the emulsifying agents is in the order

1._____ 2._____ 3. _____

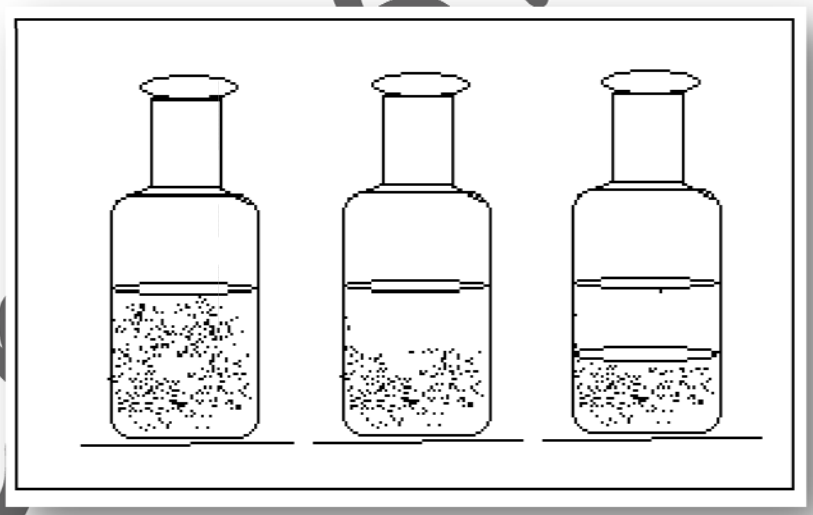
(most effective) *(least effective)*

Observation Table:

Bottle No	Emulsifier added	Volume of emulsifier added	Time taken for separation of two layers in Sec
1	1% soap solution	5 drops	
2	1% detergent solution	5 drops	
3	1% gelatin solution	5 drops	

Diagram:

Bottle No: 1 2 3



IDENTIFICATION OF FUNCTION AL GROUP PRESENT IN
THE GIVEN ORGANIC COMPOUND

TEST	OBSERVATION	INFERENCE
1.TEST FOR CARBOXYLIC GROUP (-COOH)		
Compd + $NaHCO_3$	Efferversence of a gas	.: Carboxylic group is present (- COOH)
	No efferversence of a gas	.: Carboxylic group is absent
2. TEST FOR AMINO GROUP ($-NH_2$)		
Small amount of compd in a test tube + dil HCl	Substance dissolves which reappears on addition of NaOH soln	.: Amino group is ptresent ($-NH_2$)
	Substance does not dissolve	.: Amino group ($-NH_2$) is absent
3. TEST FOR PHENOLIC GROUP (Ar-OH)		
Small amount of compd + NaOH	Substance is soluble and is regenerated by addition of dil HCl	.: Phenolic group is present
	Green or violet colour obtained	.: Phenolic group is present
OR	Substance not soluble	.: Phenolic group is absent
Aqueous soln of a small amount of compd in a test tube + 2-3 ml of neutral $FeCl_3$Solution	OR	
	No green or violet colouration obtained	.: Phenolic group is absent

4.TEST FOR ALCOHOLIC GROUP **(R-OH)** Small amount of compd in a test tube + 1ml CH_3COOH + 2-3 drops of conc. H_2SO_4 . Warm this solution in a water bath, pour the contents in the test tube into a beaker containing water **OR** Compd in a test tube + small piece of Na metal	Sweet smell or fruity odour No sweet (fruity odour) Brisk efferversence No brisk efferversence	.: Alcoholic group (-OH) is present .: Alcoholic group is absent . : Alcoholic group is present .: Alcoholic group is absent

5. TEST FOR CARBONYL GROUP **(-CHO or >CO)** shake small amount of Organic compound with 2,4 dinitrophenyl hydrazine(2,4-DNP) in a test tube. **OR** Small amount of substance + Schiff's reagent (NB. Schiff's reagent shoul be fresh)	Orange –yellow ppt. is formed. Magenta (pink) colour No Magenta (pink) colour	.: Carbonyl group (aldehydic or ketonic group) is present. .: Aldehydic group is present .: Aldehydic group is absent .: Ketonic group is present.

OR DETECTION OF ALDEHYDES 1ml of compd in a clean test tube + 1ml Tollen's reagent. Warm in a water bath.	Silver mirror (or a black ppt.) is formed on the side of the test tube No silver mirror formed.	: Aldehydic group is present .: Aldehydic group is absent .: ketone may be present.
DETECTION OF KETONES 1 ml of compd in a test tube+ 1ml NaOH + I_2 soln till yellow. Warm on a water bath; add more I_2 till colour persent. Cool under a tap. **OR** Dissolve a crystal of sodium nitroprusside in 1ml distilled water. Add 0.5 ml of compd followed by NaOH soln. dropwise.	Light yellow crystalline solid (Iodoform) separates out Red colour formed	.: Ketone group is present. .: Ketonic group is present.

IDENTIFCATION OF NATURAL ORGANIC SUBSTANCES

(any one test may be carried out given under each of the following natural substances).

A. Identification of carbohydrates

(Glucose – grape sugar, Sucrose – cane sugar, Starch – wheat flour, rice flour, potatoes, bananas)

a) Molisch's test for glucose, lactose and starch (this test is given by all types of carbohydrate free or combined states).

Prepare 5% aqueous solution of a given carbohydrate. Take 2 ml of the carbohydrate solution in a test tube, add to it 2 drops of Molisch's reagent and add cone. H_2SO_4 along the sides of the test tube so that two layers are formed. ----→ A purple coloured ring is formed at the junction of the two layers.

b) Fehling's solution test for glucose

Take 2ml of 5%aqueous of carbohydrates in a test tube. Add to it 2ml of Fehling's solution (prepared by mixing equal volumes of Fehling's solution (A) and Fehling's solution (B) Keep the test tube in boiling water → The formation of yellow or red ppt. Confirms the presence of carbohydrates (glucose).

C.T Benedict's test for glucose

Take 2ml of 5% aqueous of carbohydrates in a test tube. Add to it 2ml Benedict's solution and keep the test tube in boiling water → formation of yellow or red ppt. of Cu_2O confirms the presence of glucose.

c) Iodine test for starch

To an aqueous suspension of starch in water add a few drops of iodine solution (0.02N) →a violet or purple colour develops that confirms presence of starch (this test is exclusively used for starch).

B) IDENTIFCATION OF FATS AND OILS

(Ghee, vanaspati, butter, vegetable oil)

Place a drop of Fat or oil on a filter paper. Crush it between the folds of the filter paper. If a translucent spot is formed on the filter paper, it indicates the presence of fat or oil. Heat the filter paper having such a spot by keeping it slightly away from the flame. If the size of the spot on the filter paper increases, this further confirms the presence of fat or oil.

C) IDENTIFICATION OF PROTEINS.

(egg White / Gelatin dispersion obtained by adding 5g of gelatin in 100ml of water)

a) Take 2-3ml of egg album in water adds 2ml of dil. NaOH solution. Now add to it a few drops of $CuSO_4$ solution and heat the mixture for sometime → A violet or pink colour is obtained. (----- CONH group present in proteins forms a complex with Cu ions).

b) **C.T. for proteins**

Nihydrin test.

Take 2-3ml of egg album in solution in a test tube and add to it 3-4 drops of ninhydrin solution and heat it → A blue colour is produced which confirms the presence of proteins.

c) **Xanthoproteic test**

Take 3ml of egg album in solution (in water) in a test tube. Add to it a few drops of Cone.HNO_3 along the side of the test tube and boil. First a white ppt is obtained which changes to yellow. Now cool the test tube and add excess of 40% NaOH solution to make it alkaline. The yellow colour changes to orange confirming protein present in the egg white.

Note: Ninhydrin test is not given by gelatin.

IDENTIFCATION OF NATURAL ORGANIC SUBSTANCES

Expt No-1 *Date:-*

Aim:- To identify the given Natural Organic substance for the presence of Carbohydrate/Fat or Oil/Protein.

A. Identification of carbohydrates

1. Molisch's test for glucose, lactose and starch

TEST	OBSERVATION	INFERENCE
1. 5% aqueous solution of a given carbohydrate + 2 drops of Molisch's reagent and add cone. H_2SO_4 along the sides of the test tube	A purple coloured ring is formed at the junction of the two layers.	.: Carbohydrate is Present.

Result:- The Given Natural Organic substance contains Carbohydrate.

Note:-Enter one substance on one page.

How to write a project report?

(Order)

1. Cover page with title
2. Certificate
3. Content/Index
4. Statement of the problem/Aim
5. Introduction
6. Theory (if any)
7. Apparatus & materials required
8. Procedure +(diagram or picture if any)
9. Observations /Calculations or both
10. Results/Discussion/conclusion
11. Further investigation
12. Acknowledgement/Bibliography
13. Reference.

***Note**:- The Project report is to be written by the students in their own handwriting on A4-size Bond paper & submitted in a file. Only the cover page with title may be a computer print.*