+2 PRACTICALS	(Revised Edition	-2020)
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I - ORGANIC QUALITATIVE ANALYSIS

Formarina and Nic.	Data
Experiment No :	Date :

S.NO	Experiment	Observation	Inference
1	Odour: Note the Odour of the organic compound	Bitter almond odour	May be benzaldehyde
2	Test with litmus paper: Touch the Moist litmus paper with an organic compound	No colour change is noted	Absence of carboxylic acid , phenol and amine
3	Action with sodium bicarbonate: Take small amount of saturated sodium bi carbonate solution Add a pinch of an organic compound to it.	No brisk effervescence	Absence of a carboxylic acid
4	Action with Borsche's reagent: Take a small amount of an organic compound Add few ml of Borsche's reagent, few ml of Con HCl then warm the mixture gently and cool it.	yellow precipitate	Presence of an aldehyde or ketone
5	Charring test: Take a small amount of an organic compound in a dry test tube. Add few ml of conc H ₂ SO ₄ to it, and heat the mixture.	No Charring	Absence of carbohydrate
	Tests for Aliphatic or Ar	omatic nature	
6	Ignition test: Take small amount of the organic compound in a Nickel spatula and burn it in Bunsen flame.	Burn with sooty flame	Presence of an aromatic compound
	Tests for an unsatu	uration:	
7	Test with bromine water: Take small amount of the organic compound, add 2 ml of distilled water to dissolve it. To this solution add few drops of bromine water and shake it well	No Decolourisation takes place	Substance is saturated.
8	Test with KMnO ₄ solution: Take small amount of the organic compound add few ml of distilled water to dissolve it. To this solution add few drops of very dilute alkaline KMnO ₄ solution and shake it well.	No Decolourisation takes place	Substance is saturated
	TEST FOR SELECTED ORGANIC FUNCTIONA	AL GROUPS - Test for alc	lehvdes.
9	Tollen's reagent test: Take few ml of Tollen's	_ini_l)ktet	
dasa	reagent in a clean dry test tube. Add few drops of an organic compound, and warm the mixture for few minutes	Shining silver mirror is formed.	Presence of an aldehyde
10	Fehling's test: Take few ml each of Fehling's solution A and B are taken in a test tube. Add few drops of an organic compound to it, and warm the mixture for few minutes.	Red precipitate is formed.	Presence of an aldehyde

Report:

The given organic compound (BENZALDEHYDE) contains is

- (i) Aromatic
- (ii) Saturated
- (iii) Aldehyde functional group

Experiment No :	Date :

S.NO	Experiment	Observation	Inference
1 dasa	Odour: Note the Odour of the organic compound	No characteristic odour	Absense of aniline, phenol ,ester ,benzaldehyde
2 dasa	Test with litmus paper: Touch the Moist litmus paper with an organic compound	No colour change is noted	Absence of carboxylic acid, phenol and amine
3	Action with sodium bicarbonate: Take small amount of saturated sodium bi	No brisk	Absence of a
dast	carbonate solution Add a pinch of an organic compound to it.	effervescence	carboxylic acid
4	Action with Borsche's reagent:		D
dasa	Take a small amount of an organic compound Add few ml of Borsche's reagent, few ml of Con HCl then warm the mixture gently and cool it.	yellow precipitate	Presence of an aldehyde or ketone
5	Charring test: Take a small amount of an organic compound in	No Charring	Absence of
idasc	a dry test tube. Add few ml of conc H ₂ SO ₄ to it, and heat the mixture.	adasaidii	carbohydrate
	Tests for Aliphatic or Ar	omatic nature	
6	Ignition test: Take small amount of the organic compound in a Nickel spatula and burn it in Bunsen flame.	Burn with sooty flame	Presence of an aromatic compound
	Tests for an unsatu	uration:	•
7	Test with bromine water: Take small amount of the organic compound,	Orange - yellow	Substance is
incak	add 2 ml of distilled water to dissolve it. To this solution add few drops of bromine water and shake it well	colour of bromine water is decolourised	unsaturated.
8	Test with KMnO ₄ solution: Take small amount of the organic compound add few ml of distilled water to dissolve it. To	KMnO ₄ solution is	Substance is unsaturated
dasa	this solution add few drops of very dilute alkaline KMnO4 solution and shake it well.	decolourised	M.Padasalal.
	TEST FOR SELECTED ORGANIC FUNCTIONAL	AL GROUPS - Test for ald	lehydes.
9	Tollen's reagent test: Take few ml of Tollen's	a la LNG ét	a la LNd bi
dasa	reagent in a clean dry test tube. Add few drops of an organic compound, and warm the mixture	Shining silver mirror is formed.	Presence of an aldehyde
10	for few minutes		1 1 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2
10	Fehling's test: Take few ml each of Fehling's solution A and B are taken in a test tube. Add few drops of an organic compound to it, and warm the mixture for few minutes.	Red precipitate is formed.	Presence of an aldehyde

The given organic compound (CINNAMALDEHYDE) contains is

- (i) Aromatic
- (ii) UnSaturated
- (iii) Aldehyde functional group

Experiment No:	Date :

S.NO	Experiment	Observation	Inference
1 dasa	Odour: Note the Odour of the organic compound	No characteristic odour	Absense of aniline, phenol ,ester ,benzaldehyde
2	Test with litmus paper: Touch the Moist litmus paper with an organic compound	No colour change is noted	Absence of carboxylic acid, phenol and amine
3 dasa	Action with sodium bicarbonate: Take small amount of saturated sodium bi carbonate solution Add a pinch of an organic compound to it.	No brisk effervescence	Absence of a carboxylic acid
4	Action with Borsche's reagent: Take a small amount of an organic compound Add few ml of Borsche's reagent, few ml of Con HCl then warm the mixture gently and cool it.	red precipitate	Presence of an aldehyde or ketone
5	Charring test: Take a small amount of an organic compound in a dry test tube. Add few ml of conc H ₂ SO ₄ to it, and heat the mixture.	No Charring	Absence of carbohydrate
laask	Tests for Aliphatic or Arc	omatic nature	nadasalai.Nel
6	Ignition test: Take small amount of the organic compound in a Nickel spatula and burn it in Bunsen flame.	Burn with sooty flame	Presence of an aromatic compound
	Tests for an unsat	uration:	W.Padas
7 dasa	Test with bromine water: Take small amount of the organic compound, add 2 ml of distilled water to dissolve it. To this solution add few drops of bromine water and shake it well	No Decolourisation takes place	Substance is saturated.
8	Test with KMnO ₄ solution: Take small amount of the organic compound add few ml of distilled water to dissolve it. To this solution add few drops of very dilute alkaline KMnO ₄ solution and shake it well.	No Decolourisation takes place	Substance is saturated
	TEST FOR SELECTED ORGANIC FUNCTION	JAL GROUPS - Tast for b	etones
9	Legal's test: A small amount of the substance, few ml sodium nitro prusside solution is added. Then sodium hydroxide solution is added dropwise		Presence of a ketone

The given organic compound (ACETOPHENONE) contains is

- (i) Aromatic
- (ii) Saturated
- (iii) Ketone functional group

Experiment No:	Date :

S.NO	Experiment	Observation	Inference
1 dasa	Odour: Note the Odour of the organic compound	No characteristic odour	Absense of aniline, phenol ,ester ,benzaldehyde
2	Test with litmus paper: Touch the Moist litmus paper with an organic compound	No colour change is noted	Absence of carboxylic acid, phenol and amine
3 dasa	Action with sodium bicarbonate: Take small amount of saturated sodium bi carbonate solution Add a pinch of an organic compound to it.	No brisk effervescence	Absence of a carboxylic acid
4 da\$3	Action with Borsche's reagent: Take a small amount of an organic compound Add few ml of Borsche's reagent, few ml of Con HCl then warm the mixture gently and cool it.	red precipitate	Presence of an aldehyde or ketone
5 dasa	Charring test: Take a small amount of an organic compound in a dry test tube. Add few ml of conc H ₂ SO ₄ to it, and heat the mixture.	No Charring	Absence of carbohydrate
	Tests for Aliphatic or Ar	omatic nature	
6	Ignition test: Take small amount of the organic compound in a Nickel spatula and burn it in Bunsen flame.	Burn with sooty flame	Presence of an aromatic compound
das	Tests for an unsat	uration:	w.Padasalai.Ne
7	Test with bromine water:		
	Take small amount of the organic compound, add 2 ml of distilled water to dissolve it. To this solution add few drops of bromine water and shake it well	No Decolourisation takes place	Substance is saturated.
8	Test with KMnO ₄ solution: Take small amount of the organic compound add few ml of distilled water to dissolve it. To this solution add few drops of very dilute alkaline KMnO ₄ solution and shake it well.	No Decolourisation takes place	Substance is saturated
	TEST FOR SELECTED ORGANIC FUNCTION	JAL GROUPS - Test for k	retones.
9	Legal's test: A small amount of the substance, few ml sodium nitro prusside solution is added. Then sodium hydroxide solution is added dropwise	ush Net	Presence of a ketone

The given organic compound (BENZOPHENONE) contains is

- (i) Aromatic
- (ii) Saturated
- (iii) Ketone functional group

Experiment No:	Date ·
Experiment No	Date

S.NO	Experiment	Observation	Inference
1	Odour: Note the Odour of the organic compound	No characteristic odour	Absense of aniline, phenol ,ester ,benzaldehyde
2 das ^a	Test with litmus paper: Touch the Moist litmus paper with an organic compound	Blue litmus turns red is noted	May be a carboxylic acid or phenol
3	Action with sodium bicarbonate: Take small amount of saturated sodium bi carbonate solution Add a pinch of an organic compound to it.	Brisk effervescence	Presence of a carboxylic acid
4	Action with Borsche's reagent: Take a small amount of an organic compound Add few ml of Borsche's reagent, few ml of Con	No characteristic colour precipitate is	Absence of an aldehyde or
dasa	HCl then warm the mixture gently and cool it.	colour precipitate is formed	ketone
5 dasa	Charring test: Take a small amount of an organic compound in a dry test tube. Add few ml of conc H ₂ SO ₄ to it, and heat the mixture.	No Charring	Absence of carbohydrate
	Tests for Aliphatic or Ar	omatic nature	
6	Ignition test: Take small amount of the organic compound in a Nickel spatula and burn it in Bunsen flame.	Burn with sooty flame	Presence of an aromatic compound
	Tests for an unsat	uration:	
7	Test with bromine water: Take small amount of the organic compound, add 2 ml of distilled water to dissolve it. To this solution add few drops of bromine water and shake it well	No Decolourisation takes place	Substance is saturated.
8	Test with KMnO ₄ solution: Take small amount of the organic compound add few ml of distilled water to dissolve it. To this solution add few drops of very dilute alkaline KMnO ₄ solution and shake it well.	No Decolourisation takes place	Substance is saturated
7	TEST FOR SELECTED ORGANIC FUNCTIONAL GR	OUPS - TEST FOR CARBO	OXYLIC ACIDS.
	- NASA	Nebt	
9	Esterification reaction: Take a pinch of solid of an organic compound, Add few ml of ethyl alcohol and few drops of conc. sulphuric acid to it. Heat the reaction mixture strongly for about few minutes. Then	A Pleasant fruity odour is noted.	Presence of carboxylic group.
	pour the mixture into a beaker containing dil. Sodium carbonate solution and note the smell.	NAM	W -1 -2

The given organic compound (BENZOIC ACID) contains is

- (i) Aromatic
- (ii) Saturated
- (iii) Carboxilic acid functional group

Experiment No:	Date :

S.NO	Experiment	Observation	Inference	
1 dasa	Odour: Note the Odour of the organic compound	No characteristic odour	Absense of aniline, phenol ,ester ,benzaldehyde	
2	Test with litmus paper: Touch the Moist litmus paper with an organic compound	Blue litmus turns red is noted	May be a carboxylic acid or phenol	
3 (dasa	Action with sodium bicarbonate: Take small amount of saturated sodium bi carbonate solution Add a pinch of an organic compound to it.	ake small amount of saturated sodium bi arbonate solution. Add a pinch of an organic		
4	Action with Borsche's reagent: Take a small amount of an organic compound Add few ml of Borsche's reagent, few ml of Con HCl then warm the mixture gently and cool it.	No characteristic colour precipitate is formed	Absence of an aldehyde or ketone	
5 dasa	Charring test: Take a small amount of an organic compound in a dry test tube. Add few ml of conc H ₂ SO ₄ to it, and heat the mixture.		Absence of carbohydrate	
	Tests for Aliphatic or Ar	omatic nature		
6	Ignition test: Take small amount of the organic compound in a Nickel spatula and burn it in Bunsen flame.	Burn with sooty flame	Presence of an aromatic compound	
	Tests for an unsat	uration:		
7	Test with bromine water: Take small amount of the organic compound, add 2 ml of distilled water to dissolve it. To this solution add few drops of bromine water and shake it well	Decolourisation takes place	Substance is Unsaturated.	
8	Test with KMnO ₄ solution: Take small amount of the organic compound add few ml of distilled water to dissolve it. To this solution add few drops of very dilute alkaline KMnO ₄ solution and shake it well.	Decolourisation takes place	Substance is Unsaturated	
7	TEST FOR SELECTED ORGANIC FUNCTIONAL GRO	OUPS - TEST FOR CARBO	OXYLIC ACIDS.	
9	Esterification reaction: Take a pinch of solid of an organic compound, Add few ml of ethyl alcohol and few drops of conc. sulphuric acid to it. Heat the reaction mixture strongly for about few minutes. Then pour the mixture into a beaker containing dil. Sodium carbonate solution and note the smell.	A Pleasant fruity odour is noted.	Presence of carboxylic group.	

The given organic compound (CINNAMIC ACID) contains is

- (i) Aromatic
- (ii) UnSaturated
- (iii) Carboxilic acid functional group

Experiment No:	Date ·
Experiment No	Date

S.NO	Experiment	Observation	Inference
1	Odour: Note the Odour of the organic compound	No characteristic odour	Absense of aniline, phenol ,ester ,benzaldehyde
2	Test with litmus paper: Touch the Moist litmus paper with an organic compound	No colour change is noted	Absence of carboxylic acid, phenol and amine
3	Action with sodium bicarbonate: Take small amount of saturated sodium bi carbonate solution Add a pinch of an organic compound to it.	small amount of saturated sodium bi No brisk nate solution Add a pinch of an organic effervescence	
4	Action with Borsche's reagent: Take a small amount of an organic compound Add few ml of Borsche's reagent, few ml of Con HCl then warm the mixture gently and cool it.	No characteristic precipitate	Absence of an aldehyde or ketone
5	Charring test: Take a small amount of an organic compound in a dry test tube. Add few ml of conc H ₂ SO ₄ to it, and heat the mixture.	No Charring	Absence of carbohydrate
	Tests for Aliphatic or Arc	omatic nature	
6	Ignition test: Take small amount of the organic compound in a Nickel spatula and burn it in Bunsen flame.	Burn with non sooty flame	Presence of an aliphatic compound
dāsa	Tests for an unsat	uration:	w.Padasalai.Ne
7	Test with bromine water: Take small amount of the organic compound , add few ml of distilled water to dissolve it. To this solution add few drops of bromine water and shake it well	No Decolourisation takes place	Substance is saturated.
8	Test with KMnO ₄ solution: Take small amount of the organic compound add few ml of distilled water to dissolve it. To this solution add few drops of very dilute alkaline KMnO ₄ solution and shake it well.	No Decolourisation takes place	Substance is saturated
	TEST FOR SELECTED ORGANIC FUNCTION	AL GROUPS - Test for d	iamide
9.	Biuret test: Take A small amount of an organic compound, Heat strongly and then cool. Dissolve the residue with few ml of water. Then Add few ml of dilute copper sulphate solution and few	Violet colour is appeared	presence of a diamide
	drops of 10% NaOH solution drop by drop.		

The given organic compound (${\it UREA}$) contains is

- (i) Aliphatic
- (ii) Saturated
- (iii) diamide functional group

Experiment No :	Date :

S.NO	Experiment	Observation	Inference	
1 dasa	Odour: Note the Odour of the organic compound	No characteristic odour	Absense of aniline, phenol ,ester ,benzaldehyde	
2	Test with litmus paper: Touch the Moist litmus paper with an organic compound	No colour change is noted	Absence of carboxylic acid, phenol and amine	
3	Action with sodium bicarbonate: Take small amount of saturated sodium bi carbonate solution Add a pinch of an organic compound to it.	No brisk effervescence	Absence of a carboxylic acid	
4	Action with Borsche's reagent: Take a small amount of an organic compound Add few ml of Borsche's reagent, few ml of Con HCl then warm the mixture gently and cool it.	yellow precipitate	Presence of an aldehyde or ketone	
5	Charring test: Take a small amount of an organic compound in a dry test tube. Add few ml of conc H2SO4 to it, and heat the mixture.	Charring takes place with smell of burnt sugar	Presence of carbohydrate	
6	Tests for Aliphatic or Arc		B College C	
6	Ignition test: Take small amount of the organic compound in a Nickel spatula and burn it in Bunsen flame.	Burn with non sooty flame	Presence of an aliphatic compound	
	Tests for an unsatu	ıration:	olabi Me	
7	Test with bromine water: Take small amount of the organic compound , add few ml of distilled water to dissolve it. To this solution add few drops of bromine water and shake it well	No Decolourisation takes place	Substance is saturated.	
8	Test with KMnO4 solution : Take small amount of the organic compound add few ml of distilled water to dissolve it. To this solution add few drops of very dilute alkaline KMnO4 solution and shake it well.	No Decolourisation takes place	Substance is saturated	
dasa	TEST FOR SELECTED ORGANIC FUNCTIONAL GROU	PS - Test for Aldehyde &	carbohydrate	
9	Tollen's reagent test: Take few ml of Tollen's reagent in a clean dry test tube. Add few drops of an organic compound, and warm the mixture for few minutes	Shining silver mirror is formed.	2/////	
10	Fehling's test: Take few ml each of Fehling's solution A and B are taken in a test tube. Add few drops of an organic compound to it, and warm the mixture for few minutes.	Red precipitate is formed.	Presence of an aldehyde	
11	Molisch's test : Take A small amount of an organic compound is dissolved in few ml of water. Add few drops of alpha naphthol .Then add conc H2SO4 through the sides of test tube carefully.	w Violet ring is formed Presence of		
12	Osazone test: Take A small amount of an organic compound, Add few ml of phenyl hydrazine solution and heat the mixture for about 5 minutes on a boiling water bath	Yellow crystals are obtained	Presence of carbohydrate	

Report: The given organic compound (GLUCOSE) contains is

- (i) Aliphatic
- (ii) Saturated
- (iii) Carbohydrate with Aldehyde functional group

S.NO	Experiment	Observation	Inference
1	Odour: Note the Odour of the organic compound	Fish odour	May be an amine
2	Test with litmus paper: Touch the Moist litmus paper with an organic compound	Red litmus turns Blue is noted	May be an amine
3 dast	Action with sodium bicarbonate: Take small amount of saturated sodium bi carbonate solution Add a pinch of an organic compound to it.	No Brisk effervescence	Absence of a carboxylic acid
4	Action with Borsche's reagent: Take a small amount of an organic compound Add few ml of Borsche's reagent, few ml of Con HCl then warm the mixture gently and cool it.	No characteristic colour precipitate is formed	Absence of an aldehyde or ketone
5 dast	Charring test: Take a small amount of an organic compound in a dry test tube. Add few ml of conc H ₂ SO ₄ to it, and heat the mixture.	No Charring	Absence of carbohydrate
	Tests for Aliphatic or Ar	omatic nature	
6	Ignition test: Take small amount of the organic compound in a Nickel spatula and burn it in Bunsen flame.	Burn with sooty flame	Presence of an aromatic compound
	Tests for an unsat	uration:	
7	Test with bromine water : Take small amount of the organic compound, add few ml of distilled water to dissolve it. To this solution add few drops of bromine water and shake it well	No Decolourisation takes place	Substance is saturated.
8	Test with KMnO ₄ solution: Take small amount of the organic compound add few ml of distilled water to dissolve it. To this solution add few drops of very dilute alkaline KMnO ₄ solution and shake it well.	No Decolourisation takes place	Substance is saturated
		i i Nakt	i i i Nak
dās	TEST FOR SELECTED ORGANIC FUNCTION	AL GROUPS - Test for ar	amine.

The given organic compound (ANILINE) contains is

- (i) Aromatic
- (ii) Saturated
- (iii) Amine functional group

Experiment No :	Date :

S.NO	Experiment	Observation	Inference
1	Odour: Note the Odour of the organic compound	Phenolic odour	Presense of phenol
2	Test with litmus paper: Touch the Moist litmus paper with an organic compound	Blue litmus turns red is noted	May be a carboxylic acid or phenol
3	Action with sodium bicarbonate: Take small amount of saturated sodium bi carbonate solution Add a pinch of an organic compound to it.	No Brisk effervescence	Absence of a carboxylic acid
4	Action with Borsche's reagent: Take a small amount of an organic compound Add few ml of Borsche's reagent, few ml of Con HCl then warm the mixture gently and cool it.	No characteristic colour precipitate is formed	Absence of an aldehyde or ketone
5	Charring test: Take a small amount of an organic compound in a dry test tube. Add few ml of conc H ₂ SO ₄ to it, and heat the mixture.	No Charring	Absence of carbohydrate
Have	Tests for Aliphatic or Arc	omatic nature	W.hanaa.
6	Ignition test: Take small amount of the organic compound in a Nickel spatula and burn it in Bunsen flame.	Burn with sooty flame	Presence of an aromatic compound
	Tests for an unsatu	aration:	
7	Test with bromine water : Take small amount of the organic compound,add few ml of distilled water to dissolve it. To this solution add few drops of bromine water and shake it well	No Decolourisation takes place	Substance is saturated.
8	Test with KMnO ₄ solution: Take small amount of the organic compound add few ml of distilled water to dissolve it. To this solution add few drops of very dilute alkaline KMnO ₄ solution and shake it well.	No Decolourisation takes place	Substance is saturated
TES	ST FOR SELECTED ORGANIC FUNCTIONAL GROU	PS - TEST FOR PHENOL & (CARBOXYLIC ACIDS.
9	Neutral FeCl ₃ test : Take few ml of neutral ferric chloride solution is taken, Add a pinch of solid Of organic compound to it.	Violet colouration is seen	Presence of phenol
9	Esterification reaction: Take a pinch of solid of an organic compound, Add few ml of ethyl alcohol and few drops of conc. sulphuric acid to it. Heat the reaction mixture strongly for about few minutes. Then pour the mixture into a beaker containing dil.	A Pleasant fruity odour is noted.	Presence of carboxylic group.

The given organic compound (SALICYLIC ACID) contains is

- (i) Aromatic
- (ii) Saturated
- (iii) Phenol with Carboxilic acid functional group

II-VOLUMETRIC ANALYSIS

1.Estimation of Ferrous Sulphate (Fe²⁺)

To estimate the amount of ferrous sulphate dissolved in 750 ml of the given unknown solution volumetrically. For this you are given with a standard solution of ferrous ammonium sulphate (FAS) of normality 0.1102 N and potassium permanganate solution as link solution.

Short procedure:

S.No	Content	Titration - I	Titration - I
1.	Burette solution	KMnO ₄	KMnO ₄
2.	Pipette solution	20 ml of standard FAS	20 ml of unknown FeSO ₄
3.	Acid to be added	20ml of 2N H ₂ SO ₄ (approx)	20ml of 2N H ₂ SO ₄ (approx.)
4.			Lab temperature
5.			Self-indicator (KMnO ₄)
6. End point Appearance of permanent pale pink colour		Appearance of permanent pale pink colour	Appearance of permanent pale pink colour
7.	Equivalent weight o		

Titration - I (Link KMnO₄) Vs (Standard FAS) Indicator: self indicator (KMnO₄)

		-)		(-4)		
S.No	Volume of standard FAS (ml)	Burette readings		Burette readings		Concordant value
	- state - state	Initial (ml)	Final(ml)	(Volume of KMnO4) (ml)		
1.00	20	0	asestal."	eraealal.lver		
2.	20	0	J. W	WWW.Faus		

Calculation:

Volume of KMnO ₄ (link) solution	(V_1)	=	ml	
Normality KMnO ₄ (link) solution	(N_1)	=	N	
Volume of standard FAS solution	(V_2)	= 20	ml	
Normality of standard FAS solution	(N_2)	= 0.1102	N	
According to normality equation:	N 1 / N 1 -	$1 = V_2 \times N_2$		
$N_1 = \frac{V_2 \times N_2}{N_1} \qquad N_2$	$_{1} = \frac{20 \times}{}$	0.1102	$N_1 =X$	-N

Normality of KMnO₄ (link) solution (N₁) = $\underline{\hspace{1cm}}$ x N

Indicator: self indicator (KMnO₄) Titration - II (Link KMnO₄) Vs (Unknown FeSO₄)

			(=====================================		
S.No	Volume of standard FeSO ₄	Burette readings		Concordant value	
30000	(ml)	Initial (ml)	Final(ml)	(Volume of KMnO ₄) (ml)	
1.	20	0			
2.	20	0			

Calculation:

Volume of Unknown FeSO ₄ solution	$V_1 = 20 \text{ ml}$	
Normality of Unknown FeSO ₄ solution	$N_1 = ? N$	
Volume of KMnO4 (link) solution	$V_2 = \dots ml$	
Normality KMnO ₄ (link) solution	$N_2 = X N$	
According to normality equation:	$V_1 \times N_1 = V_2 \times N_2$	
	$N_1 = \frac{V_2 \times N_2}{V_1}$	$N_1 = \frac{\cdots \times X}{20}$ $N_1 = \cdots Y - N$
The manuality of audinosis E.CO. selections	_ V N	

The normality of unknown FeSO₄ solution = $\underline{\hspace{1cm}}$ Y $\underline{\hspace{1cm}}$ N

Weight calculation:

The amount of FeSO₄ dissolved in 1 lit of the solution = (Normality) x (equivalent weight)

The amount of $FeSO_4$ dissolved in 750 ml of the solution = Y x 278 x 750 1000

Report

- Normality of KMnO₄ (link) solution (N₁) (i)
- = _____ N = _____N The normality of unknown FeSO₄ solution (ii)
- The amount of FeSO₄ dissolved in 750 ml of the solution (iii)

2. Estimation of Ferrous Ammonium Sulphate (FAS)

Aim: To estimate the amount of ferrous ammonium sulphate (FAS) dissolved in 1500 ml of the given unknown solution volumetrically. For this you are given with a standard solution of ferrous sulphate (FeSO₄) of normality 0.1024 N and potassium permanganate solution as link solution..

Short procedure:

S.No	Content	Titration - I	Titration - I
1.	Burette solution	KMnO ₄	KMnO ₄
2.	Pipette solution	20 ml of standard FeSO ₄	20 ml of unknown FAS
3.	Acid to be added	20ml of 2N H ₂ SO ₄ (approx)	20ml of 2N H ₂ SO ₄ (approx.)
4.	Temperature	Lab temperature	Lab temperature
5.	Indicator	Self-indicator (KMnO ₄)	Self-indicator (KMnO ₄)
6.	End point	Appearance of permanent pale pink colour	Appearance of permanent pale pink colour
7.	Equivalent weight of FAS = 392		

Titration - I (Link KMnO₄) Vs (Standard FeSO₄) Indicator : self indicator (KMnO₄)

S.No	Volume of standard FeSO ₄ (ml)	Burette readings	Concordant value
		Initial (ml) Final(ml)	(Volume of KMnO ₄) (ml)
1.	20	0	iet augi Net
2.	20	0	- Padasalai

Calculation:

Volume of KMnO4 (link) solution	(V_1)	= ml
Normality KMnO ₄ (link) solution	(N_1)	=? N
Volume of standard FeSO ₄ solution	(V ₂)	= 20 ml
Normality of standard EoCO. solution	(N_a)	- 0.1024 N

Normality of KMnO₄ (link) solution (N₁) = $_$

Indicator: self indicator (KMnO₄) Titration - II (Link $KMnO_4$) Vs (Unknown FAS)

S.No	Volume of Unknown FAS	Burette readings		Concordant value
200-	(ml)	Initial (ml)	Final(ml)	(Volume of KMnO ₄) (ml)
1.	20	0		
2.	20	0		La

Calculation:

Volume of Unknown FAS solution	$V_1 = 20 \text{ ml}$
Normality of Unknown FAS solution	$N_1 = ? \dots N$
Volume of KMnO ₄ (link) solution	$V_2 = \dots ml$
Normality KMnO ₄ (link) solution	$N_2 = X N$
According to normality equation:	$V_1 \times N_1 = V_2 \times N_2$

$$N_1 = \frac{V_2 \times N_2}{V_1}$$

$$N_1 = \frac{}{V_1}$$

$$N_1 = V_2 \times N_2$$

$$N_1 = \frac{V_2 \times N_2}{V_1}$$

$$N_1 = \frac{\dots \times X}{20}$$

$$N_1 = \dots Y - \dots Y$$

The normality of unknown FAS solution = ____Y____

Weight calculation:

The amount of FAS dissolved in 1 lit of the solution = (Normality) x (equivalent weight) The amount of FAS dissolved in 1500 ml of the solution = $\frac{Y}{X} \times \frac{392}{X} \times \frac{1500}{X}$ 1000

Report:

(i)

(ii)

- (iii)

3. Estimation of oxalic acid

Aim: To estimate the amount of oxalic acid dissolved in 500 ml of the given solution volumetrically. For this you are given with a standard solution of ferrous ammonium sulphate(FAS)of normality 0.1 N and potassium permanganate solution as link solution.

Short procedure:

bhort procedure.		A AM AN A S	TANK WEST
S.No	Content	Titration - I	Titration - I
1.	Burette solution	KMnO ₄	KMnO ₄
2.	Pipette solution	20 ml of standard FAS	20 ml of unknown Oxalic acid
3.	Acid to be added	20ml of 2N H ₂ SO ₄ (approx)	20ml of 2N H ₂ SO ₄ (approx.)
4.	Temperature	Lab temperature	60° - 70° c
5.	Indicator	Self-indicator (KMnO ₄)	Self-indicator (KMnO ₄)
6.	End point	Appearance of permanent pale pink colour	Appearance of permanent pale pink colour
7.	Equivalent weight of Oxalic acid = 63		

Titration - I (Link KMnO₄) Vs (Standard FAS Solution) Indicator: self indicator (KMnO₄)

	. ,		,	()
S.No	Volume of standard FAS (ml)	Burette readings		Concordant value
,,,,,	WWW.L OCC.	Initial (ml)	Final(ml)	(Volume of KMnO ₄) (ml)
1.	20	0		
2.	20	0	NK	St. Skilds

Calculation:

Volume of KMnO ₄ (link) solution	$(V_1) = ml$	
Normality KMnO4 (link) solution	$(N_1) = N$	
Volume of standard FAS solution	$(V_2) = 20 ml$	
Normality of standard FAS solution	$(N_2) = 0.1 N$	
According to normality equation:	$V_1 \times N_1 = V_2 \times N_2$	
$N_1 = \frac{V_2 \times N_2}{V_1}$	$N_1 = \frac{20 \times 0.1}{} N_1 =$	·XN

Normality of KMnO₄ (link) solution (N₁) = $\underline{\hspace{1cm}}$ x

Titration - II (Link KMnO₄) Vs (Unknown oxalic acid) Indicator: self indicator (KMnO₄)

	• • • • •			
S.No	Volume of Unknown oxalic acid	Burette readings		Concordant value
iaack	(ml)	Initial (ml)	Final(ml)	(Volume of KMnO ₄) (ml)
1.	20	0	300-	WWW.Pau
2.	20	0		

Calculation:

Volume of Unknown oxalic acid solution	$V_1 = 20 \text{ ml}$	
Normality of Unknown oxalic acid solution	$N_1 = ? \dots N$	
Volume of KMnO ₄ (link) solution	$V_2 = \dots ml$	
Normality KMnO ₄ (link) solution	$N_2 = X N$	
According to normality equation:	$V_1 \times N_1 = V_2 \times N_2$	
	$N_1 = \frac{V_2 \times N_2}{V_1}$ $N_1 = \frac{\dots \times X_2}{20}$	$N_1 =N$
mb	1	

The normality of unknown oxalic acid solution = ____Y____N

Weight calculation:

The amount of oxalic acid dissolved in 1 lit of the solution = (Normality) x (equivalent weight) The amount of oxalic acid dissolved in 500 ml of the solution Y x 63 x 500 1000

Report:

- Normality of KMnO₄ (link) solution (N₁) (i) = ____x___ N
- The normality of unknown oxalic acid solution = ____ N (ii)
- The amount of oxalic acid dissolved in 500 ml of the solution (iii)

4. Estimation of sodium hydroxide

To estimate the amount of sodium hydroxide dissolved in 250 ml of the given unknown solution volumetrically. For this you are given with a standard solution of sodium carbonate solution of normality 0.0948 N and hydrochloric acid solution as link solution.

Short procedure:

S.No	Content	Titration - I	Titration - I
1.	Burette	HCl (link solution)	HCl (link solution)
asak	solution	saalal Net	ai Net
2.	Pipette solution	20 ml of standard Na ₂ CO ₃ solution	20 ml of unknown NaOH solution
3.	Temperature	Lab temperature	Lab temperature
4.	Indicator	Methyl orange	Phenolphthalein
5.	End point	Colour change from straw yellow to pale pink	Disappearance of pink colour
6.	Equivalent weight of NaOH = 40		

Titration - I (Link HCl.) Vs. (Standard Na₂CO₃ Solution) Indicator: Methyl orange

2 2 0 2 0 2 0	1 (2000) 15 (3000 000 000 000 000 000 000 000 000	000000000	,	111011011011
S.No	Volume of standard Na ₂ CO ₃ Solution	Burette readings		Concordant value
	(ml)	Initial (ml)	Final(ml)	(Volume of HCl) (ml)
1.	20	0		
2.	20	0	1 - 1 N/k	Lt Linkskt

Calculation:

- ml
N
ml
8 N
$N_1 =N$

Titration - II (Link HCl) Vs (Unknown NaOH) Indicator: Phenolphthalein

					· · · · · · · · · · · · · · · · · · ·	
	S.No	Volume of Unknown NaOH	Burette readings		Concordant value	
	LASSE	(ml)	Initial (ml)	Final(ml)	(Volume of HCl) (ml)	
	1.	20	0		VWWW.Fau	
	2.	20	0			

Calculation:

Volume of Unknown NaOH solution	$V_1 = 20 \text{ ml}$	
Normality of Unknown NaOH solution	$N_1 = ? \dots N$	
Volume of HCl (link) solution	$V_2 = \dots ml$	
Normality of HCl (link) solution	$N_2 = X N$	
According to normality equation:	$V_1 \times N_1 = V_2 \times N_2$	
	$N_1 = \frac{V_2 \times N_2}{V_1}$ $N_1 = \frac{\dots \times}{20}$	$N_1 =N$
The normality of unknown NaOH solution	= V N	

The normality of unknown **NaOH** solution

Weight calculation:

The amount of **NaOH** dissolved in 1 lit of the solution = (Normality) x (equivalent weight)

The amount of **NaOH** dissolved in 250 ml of the solution = $\frac{Y}{x}$ $\frac{x}{40}$ $\frac{x}{x}$ $\frac{250}{x}$ 1000



Report:

- Normality of HCl (link) solution (N₁) (i)
- = ____x ___ N = ____Y ____ N The normality of unknown **NaOH** solution (ii)
- The amount of NaOH dissolved in 250 ml of the solution (iii)

Indicator: Phenolphthalein

5. Estimation of oxalic acid

Aim: To estimate the amount of oxalic acid dissolved in 1250 ml of the given unknown solution volumetrically. For this you are given with a standard solution of HCl solution of normality 0.1010 N and sodium hydroxide solution as link solution.

Short procedure:

0	noi provouni.				
S.No Content		Titration - I	Titration - I		
1. Burette solution HCl (standard solution)		KMnO ₄			
2. Pipette solution 20 ml of NaOH link solution		20 ml of NaOH link solution	20 ml of NaOH link solution		
3. Temperature Lab temperature		Lab temperature	Lab temperature		
4. Indicator Phenolpl		Phenolphthalein	Phenolphthalein		
5. End point Disappearance of pinkcolour		Disappearance of pinkcolour	Disappearance of pink colour		
6. Equivalent weight of Oxalic acid = 63		f Oxalic acid = 63	isi Net		

Titration - I (standard HCl) Vs (link NaOH)

S.No	Volume of standard NaOH (ml)	Burette readings		Concordant value
3000	WANTE PROPERTY.	Initial (ml)	Final(ml)	(Volume of standard HCl) (ml)
1.	20	0		
2.	20	0		at a second and a second as

Calculation:

Volume of NaOH (link) solution	(V_1)	WW.PZ	20	ml
Normality NaOH (link) solution	(N_1)	=	?	N
Volume of standard HCl solution	(V_2)	=		ml
Normality of standard HCl solution	(N_2)	-	0.101	0 N
7.4	***		7	

According to normality equation :
$$V_1 \times N_1 = V_2 \times N_2$$
 $N_1 = \frac{V_2 \times N_2}{V_1}$ $N_1 = \frac{V_2 \times N_2}{V_1}$ $N_2 = \frac{V_2 \times N_2}{V_1}$ $N_3 = \frac{V_3 \times N_2}{V_1}$ $N_4 = \frac{V_2 \times N_2}{V_1}$ $N_5 = \frac{V_3 \times N_2}{V_1}$ $N_5 = \frac{V_3 \times N_2}{V_1}$

Normality of NaOH (link) solution $(N_1) =$

Titration - II (Link NaOH) Vs (Unknown oxalic acid) Indicator: Phenolphthalein

S.No	Volume of NaOH	Burette readings		Concordant value
	(ml)	Initial (ml)	Final(ml)	(Volume of oxalic acid) (ml)
1.	20	0	adasar	www.Padasaid
2.	20	0		- AA A

Calculation:

Calculation:	
Volume of Unknown oxalic acid solution	$V_1 = \dots ml$
Normality of Unknown oxalic acid solution	$N_1 =? N$
Volume of NaOH (link) solution V	$V_2 = 20 \text{ ml}$
Normality NaOH (link) solution	$N_2 = X N$
According to normality equation : $V_1 \times V_2 \times V_3 \times V_4 \times V_4 \times V_5 \times V_4 \times V_5 \times V_5 \times V_5 \times V_6 \times $	$N_1 = V_2 \times N_2$
$N_1 = \frac{V_2}{1}$	$\frac{\times N_2}{V_1}$ $N_1 = \frac{20 \times X}{\dots N_1}$ $N_1 = \dots N$
The normality of unknown oxalic acid solution =	Y N
Weight calculation:	

The amount of oxalic acid dissolved in 1 lit of the solution = (Normality) x (equivalent weight) The amount of oxalic acid dissolved in 1250 ml of the solution = \underline{Y} x 63 x 1250

Report:

- Normality of NaOH (link) solution (N₁) = ____x ___ N = ____Y ____ N (i) The normality of unknown oxalic acid solution (ii)
- (iii) The amount of oxalic acid dissolved in 1250 ml of the solution