

THE HNSB.LTD. SCIENCE COLLEGE, HIMATNAGAR



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B.Sc., Semester - 4

CHEMISTRY PRACTICAL RECORD BOOK

YEAR: 2005-26

Program Name : **B. Sc. Chemistry** Semester : **IV**

PROGRAM CODE : SCIUG102

COURSE CODE : SC23PMJDSCCHE401

Type of Course : **Practicals Major Discipline Specific Course PMJDSC**

Name of Course : **Practical's for Basic chemistry II**

Total Marks : 100

Name of Student: _____

Group: _____ Practical Batch: _____

Roll Number: _____ Exam No: _____

Mobile Number: _____

Program Name : **B. Sc. Chemistry** Semester : **IV**
PROGRAM CODE : SCIUG102
COURSE CODE : SC23PMJDSCCHE401

Type of Course : Practicals Major Discipline Specific Course PMJDSC

Name of Course : Practical's for Basic chemistry II

Total Marks : 100

GROUP A

Total Credits : 02	Teaching Hours per Week: 04 Lab Teaching Hours per semester:60 Minimum Number Practicals to be Performed: 12	Practicals	External 25 Marks Internal 25 Marks
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GROUP B

Total Credits : 02	Teaching Hours per Week: 04 Lab Teaching Hours per semester:60 Minimum Number Practicals to be Performed: 08	Practicals	External 25 Marks Internal 25 Marks
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Program Name : **B. Sc. Chemistry** Semester : **IV**

PROGRAM CODE : SCIUG102
COURSE CODE : SC23PMIDSCCHE402

Type of Course : Practicals Minor (Elective) Discipline Specific Course PMIDSC

Name of Course : Practical's for simplified chemistry I

Total Marks : 50

Effective from June 2023 Under NEP 2020

Total Credits : 02	Teaching Hours per Week: 04 Lab Teaching Hours per semester:60 Minimum Number Practicals to be Performed: 10	Practicals	External 25 Marks Internal 25 Marks
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Practical Index

Group A: Organic Separation and Identification. (Internal 25 and External 25 Marks)

For Major- Disciplinary

No.	Practical	Practical date	Teacher's Sign. /Date
1	Organic Qualitative (Binary mixture)		
2	Organic Qualitative (Binary mixture)		
3	Organic Qualitative (Binary mixture)		
4	Organic Qualitative (Binary mixture)		
5	Organic Qualitative (Binary mixture)		
6	Organic Qualitative (Binary mixture)		
7	Organic Qualitative (Binary mixture)		
8	Organic Qualitative (Binary mixture)		

Group B: Quantitatively analysis. (Internal 25 and External 25 Marks)

For Major- Disciplinary and Multi-Disciplinary.

No.	Practical	Practical date	Teacher's Sign. /Date
1	Estimation of Ca by complexometric titration.		
2	Estimation of Mg by complexometric titration.		
3	Estimation of Cu by complexometric titration.		
4	Estimation of Cu by iodometrically.		
5	Estimation of Zn by complexometric titration.		
6	Estimation of Ni by complexometric titration.		
7	Estimation of Aniline/Phenol		
8	Estimation of Glucose.		
9			

Organic Qualitative Analysis (B.Sc.Sem-IV)

Subject: Chemistry

Practical No- 01

Date:.....

[A] Preliminary Test of Binary organic mixture:

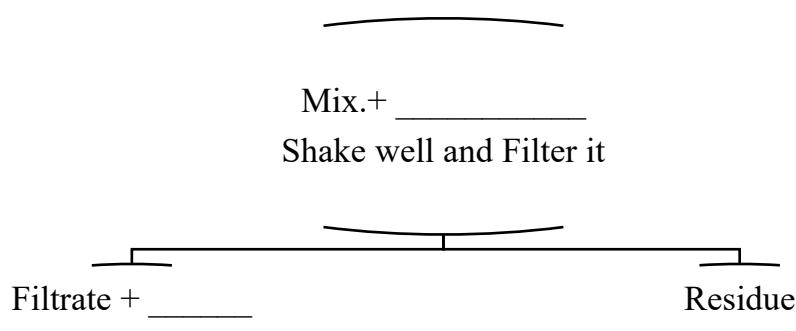
No	Test	Observation	Inferences
1	State		
2	Colour		
3	Order		

[B] Type of the Binary organic mixture:

No	Test	Observation	Inferences
1	Mixture + Sat. NaHCO ₃ Filtrate+ +50% HCl		
2	Residue + 20% NaOH Filtrate+ +50% HCl		
3	Residue + 50% HCl Filtrate+ + 20% NaOH		
4	Remaining Residue		

Type of Binary Organic Mixture is _____ + _____ .

[C] Separation of Organic Mixture :



(1) Identification of Separated Organic Compound _____

[A] Primary Test:

No	Test	Observation	Inferences
1	State		
2	Colour of substance		
3	Order		
4	Heating Test. On Porcelain Piece		
	b. On Cu Foil (Bielstein Test)		

[B] Solubility Test. Type of Organic Compound : _____

[C] Specific Test

No	Test	Observation	Inferences
1	Com.+ NaOH +Heat		
2	Soda lime test		
3	Unsaturation Test With Br ₂ water With KMnO ₄		
4	Iodoform Test		
6	Sodium Niropruside Test		
7	Neutral FeCl ₃		

[D] Lassaigne's Test

No	Test	Observation	Inferences
1	Test for 'N' L.S.+ Fresh FeSO ₄ Heat and Cool + drops of H ₂ SO ₄ + 2 drops of FeCl ₃		
2	Test for 'S' L.S.+ Lead Acetate+ CH ₃ COOH heat.		
3	Test for 'X' L.S.+ dil. HNO ₃ + AgNO ₃		

[E] Identification of _____ Functional Group.

No	Test	Observation
1		
2		
3		
4		

[F] Detection of M.P. _____

[G] Confirmative Test of the _____ Organic Compounds.

No	Test	Observation
1		
2		
3		
4		

[H] Derivative of Compounds:

Name of Derivative: _____

Preparation:

(2) Identification of Separated Organic Compound _____

[A] Primary Test:

No	Test	Observation	Inferences
1	State		
2	Colour of substance		
3	Order		
4	Heating Test. On Porcelain Piece		
	b. On Cu Foil (Bielstein Test)		

[B] Solubility Test. Type of Organic Compound : _____

[C] Specific Test

No	Test	Observation	Inferences
1	Com.+ NaOH +Heat		
2	Soda lime test		
3	Unsaturation Test With Br ₂ water With KMnO ₄		
4	Iodoform Test		
6	Sodium Niropruside Test		
7	Neutral FeCl ₃		

[D] Lassaigne's Test

No	Test	Observation	Inferences
1	Test for 'N' L.S.+ Fresh FeSO ₄ Heat and Cool + drops of H ₂ SO ₄ + 2 drops of FeCl ₃		
2	Test for 'S' L.S.+ Lead Acetate+ CH ₃ COOH heat.		
3	Test for 'X' L.S.+ dil. HNO ₃ + AgNO ₃		

[E] Identification of _____ Functional Group.

No	Test	Observation
1		
2		
3		
4		

[F] Detection of M.P. _____

[G] Confirmative Test of the _____ Organic Compounds.

No	Test	Observation
1		
2		
3		
4		

[H] Derivative of Compounds:

Name of Derivative: _____

Preparation:

Result Table:

No.	Name of Compounds	M.F.	Nature	Present Elements	Functional Group	M.P.	Derivative
1							
2							

Signature and Date of Teacher: _____

Organic Qualitative Analysis (B.Sc.Sem-IV)

Subject: Chemistry

Practical No- 02

Date:.....

[A] Preliminary Test of Binary organic mixture:

No	Test	Observation	Inferences
1	State		
2	Colour		
3	Order		

[B] Type of the Binary organic mixture:

Type of Binary Organic Mixture is _____ + _____ .

Result Table:

No.	Name of Compounds	M.F.	Nature	Present Elements	Functional Group with name	M.P.	Derivative
1							
2							

અગત્યની નોંધ:

નોંધ: ઉપર મણેલ પરિણામો ને આધારે જરૂર માં Practical No- 01 મુજબ સંવિસ્તર લખવું

[A] Preliminary Test of Binary organic mixture:

No	Test	Observation	Inferences
1	State		
2	Colour		
3	Order		

[B] Type of the Binary organic mixture:

Type of Binary Organic Mixture is _____ + _____ .

Result Table:

No.	Name of Compounds	M.F.	Nature	Present Elements	Functional Group with name	M.P.	Derivative
1							
2							

અગત્યની નોંધ:

નોંધ: ઉપર મળેલ પરિણામો ને આધારે જરૂર માં Practical No- 01 મુજબ સંવિસ્તર લખવું

Subject: Chemistry

Practical No- 04

Date:.....

[A] Preliminary Test of Binary organic mixture:

No	Test	Observation	Inferences
1	State		
2	Colour		
3	Order		

[B] Type of the Binary organic mixture:

Type of Binary Organic Mixture is _____ + _____ .

Result Table:

No.	Name of Compounds	M.F.	Nature	Present Elements	Functional Group with name	M.P.	Derivative
1							
2							

અગ્રાંશી નોંધ:

Signature and Date of Teacher: _____
Organic Qualitative Analysis (B.Sc.Sem-IV)

Subject: Chemistry

Practical No- 05

Date:.....

[A] Preliminary Test of Binary organic mixture:

No	Test	Observation	Inferences
1	State		
2	Colour		
3	Order		

[B] Type of the Binary organic mixture:

Type of Binary Organic Mixture is _____ + _____ .

Result Table:

No.	Name of Compounds	M.F.	Nature	Present Elements	Functional Group with name	M.P.	Derivative
1							
2							

અગત્યની નોંધ:

નોંધ: ઉપર મળેલ પરિણામો ને આધારે જરૂર માં Practical No- 01 મુજબ સંવિસ્તર લખવું

Signature and Date of Teacher: _____
Organic Qualitative Analysis (B.Sc.Sem-IV)

Subject: Chemistry Practical No- 06 Date:.....

[A] Preliminary Test of Binary organic mixture:

No	Test	Observation	Inferences
1	State		
2	Colour		
3	Order		

[B] Type of the Binary organic mixture:

Type of Binary Organic Mixture is _____ + _____ .

Result Table:

No.	Name of Compounds	M.F.	Nature	Present Elements	Functional Group with name	M.P.	Derivative
1							
2							

અગત્યની નોંધ:

નોંધ: ઉપર મળેલ પરિણામો ને આધારે જરૂર માં Practical No- 01 મુજબ સંવિસ્તર લખવું

Signature and Date of Teacher: _____
Organic Qualitative Analysis (B.Sc.Sem-IV)

Subject: Chemistry

Practical No- 07

Date:.....

[A] Preliminary Test of Binary organic mixture:

No	Test	Observation	Inferences
1	State		
2	Colour		
3	Order		

[B] Type of the Binary organic mixture:

Type of Binary Organic Mixture is _____ + _____ .

Result Table:

No.	Name of Compounds	M.F.	Nature	Present Elements	Functional Group with name	M.P.	Derivative
1							
2							

અગત્યની નોંધ:

નોંધ: ઉપર મળેલ પરિણામો ને આધારે જરૂર માં Practical No- 01 મુજબ સવિસ્તર લખવું

Signature and Date of Teacher: _____
Organic Qualitative Analysis (B.Sc.Sem-IV)

Subject: Chemistry

Practical No- 08

Date:.....

[A] Preliminary Test of Binary organic mixture:

No	Test	Observation	Inferences
1	State		
2	Colour		
3	Order		

[B] Type of the Binary organic mixture:

Type of Binary Organic Mixture is _____ + _____ .

Result Table:

No.	Name of Compounds	M.F.	Nature	Present Elements	Functional Group with name	M.P.	Derivative
1							
2							

અગ્રયની નોંધ:

નોંધ: ઉપર મળેલ પરિણામો ને આધારે જરૂર માં Practical No- 01 મુજબ સાચિત્ર લખવું

Signature and Date of Teacher: _____

Preparation of standard 0.01M EDTA 250 ml Solution = 0.931 gm EDTA

Equation:

Observation:

Burette: 0.01 M EDTA

Conical Flask: 25ml dil. Ca^{+2} solu.+ 5ml 10 pH buffer + 3 drops of Indicator

Indicator : Eriochrome black-T

Colour Change: Wine red to Blue

Observation Table

B.R.	P.R	1 st reading	2 nd reading	3 rd reading	Constant Reading
Final Reading					
Initial Reading					
Difference					

Calculation :

1000 ml 1 M EDTA = 40.08 gm Ca

Analytical Chemistry : Volumetric Analysis

Practical No- 1

Date:.....

Aim: To determine the amount of Ca^{+2} in given solution by Complexometric titration.

Requirement: 0.01 M EDTA, Calcium Solution, 10 pH buffer Solution. EBT,

Procedure: To prepare St. Solution of 0.01 M EDTA solution in 250 measuring flask and fill the burette with it.

Dilute the given Ca solution up to 250 ml mark with distilled water.

Pipette out 25 ml of calcium solution in Conical flask. Add 5-7 ml of 10 pH buffer solution and 5-6 drops of Eriochrome black T indicator. Add 0.01 M EDTA solution from the burette dropwise till the red color of the solution changes to permanent blue colour. Repeat the titration to get constant reading.

Result:

- Required volu. of 0.01 M EDTA for 25 ml of Ca^{+2} Solu. = _____ ml
- The amount of Ca in given solution = _____ gm

Signature of Teacher**Preparation of standard 0.01M EDTA 250 ml Solution = 0.931 gm EDTA****Equation:****Observation:**

Burette: 0.01 M EDTA

Conical Flask: 25ml dil. Mg^{+2} solu.+ 5 ml 10 pH buffer + 5 drops of Indicator

Indicator : Eriochrome black-T

Colour Change: Wine red to Blue

Observation Table

B.R.	P.R	1 st reading	2 nd reading	3 rd reading	Constant Reading
Final Reading					
Initial Reading					
Difference					

Calculation :

$$1000 \text{ ml } 1 \text{ M EDTA} = 24.3 \text{ gm Mg}$$

Analytical Chemistry : Volumetric Analysis

Practical No- 2

Date:.....

Aim: To determine the amount of Mg^{+2} in given solution by Complexometric titration.

Requirement:

0.01 M EDTA, Magnesium Solution, 10 pH buffer Solution. EBT,

Procedure: To prepare St. Solution of 0.01 M EDTA solution in 250 measuring flask and fill the burette with it.

Dilute the given Mg solution up to 250 ml mark with distilled water.

Pipette out 25 ml of Magnesium solution in Conical flask. Add 5-7 ml of 10 pH buffer solution and 5-6 drops of Eriochrome black T indicator. Add 0.01 M EDTA solution from the burette dropwise till the red color of the solution changes to permanent blue color. Repeat the titration to get constant reading.

Result:

- Required volu. of 0.01 M EDTA for 25 ml of Mg^{+2} Solu. = _____ ml
- The amount of Mg in given solution = _____ gm

Signature of Teacher

Preparation of standard 0.01M EDTA 250 ml Solution = 0.931 gm EDTA

Equation:

Observation:

Burette: 0.01 M EDTA

Conical Flask: 25ml dil. Cu^{+2} solu.+ 5ml Con. Ammonia solution. + 5 drops of Indicator

Indicator : Fast Sulfone Black-F

Colour Change: Blue(violet) to Deep Green

Observation Table

B.R.	P.R	1 st reading	2 nd reading	3 rd reading	Constant Reading
Final Reading					
Initial Reading					
Difference					

Calculation :

1000 ml 1 M EDTA = 63.5 gm Cu

Analytical Chemistry : Volumetric Analysis

Practical No- 3

Date:.....

Aim: To determine the amount of Cu^{+2} in given solution by Complexometric titration.

Requirement:

0.01 M EDTA, Coper Solution, Con. Ammonia Solution. FS-black F,

Procedure: To prepare St. Solution of 0.01 M EDTA solution in 250 measuring flask and fill the burette with it.

Dilute the given Cu solution up to 250 ml mark with distilled water.

Pipette out 25 ml of Coper Solution in Conical flask. Add 5 ml of Ammonia solution and 5-6 drops of Fast sulfone black F indicator. Add 0.01 M EDTA solution from the burette dropwise till the Blue color of the solution changes to Blue to Deep green. Repeat the titration to get constant reading.

Result:

- Required volu. of 0.01 M EDTA for 25 ml of Cu^{+2} Solu. = _____ ml
- The amount of Cu in given solution = _____ gm

Signature of Teacher**Preparation of standard 0.01N $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$, 250 ml Solution = _____ gm****Equation:****Observation:**Burette: 0.01 N $\text{Na}_2\text{S}_2\text{O}_3$ Conical Flask: 25ml dil. Cu^{+2} solu.+ 1 T.T. 10% KI + 3 ml Starch solution.

Indicator : Starch solution

Colour Change: Blue to Colorless.

Observation Table

B.R.	P.R	1 st reading	2 nd reading	3 rd reading	Constant Reading
Final Reading					
Initial Reading					
Difference					

Calculation :

$$1000 \text{ ml } 1 \text{ N } \text{Na}_2\text{S}_2\text{O}_3 = 63.54 \text{ gm Cu}$$

Analytical Chemistry Volumetric Analysis

Practical No- 4

Date:.....

Aim: To determine the amount of Cu^{+2} in given solution by Iodometric titration.

Requirement:

0.01N M $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$, Coper Solution, 10% KI, Starch,

Procedure: To prepare St. Solution of 0.01 M $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$ solution in 250 measuring flask and fill the burette with it.

Dilute the given Cu solution up to 250 ml mark with distilled water.

Pipette out 25 ml of Coper Solution in Conical flask. Add 1 Test tube 10% KI and 8-9 drops of Starch solution. Add Sodium thiosulphate solution from the burette dropwise till the blue color of the solution changes to Blue to white. Repeat the titration to get constant reading.

Result:

- Required volu. of 0.01 N $\text{Na}_2\text{S}_2\text{O}_3$ for 25 ml of Cu^{+2} Solu. = _____ ml
- The amount of Cu in given solution = _____ g

Signature of Teacher**Preparation of standard 0.01M EDTA 250 ml Solution =0.931 gm EDTA****Equation:****Observation:**

Burette: 0.01 M EDTA

Conical Flask: 25ml dil. Zn^{+2} solu.+ 5 ml 10 pH buffer + 3 drops of Indicator

Indicator : Eriochrome black-T

Colour Change: Wine red to Blue

Observation Table

B.R.	P.R	1 st reading	2 nd reading	3 rd reading	Constant Reading
Final Reading					
Initial Reading					
Difference					

Calculation :

$$1000 \text{ ml 1 M EDTA} = 63.37 \text{ gm Zn}$$

Analytical Chemistry : Volumetric Analysis

Practical No- 5

Date:.....

Aim: To determine the amount of Zn^{+2} in given solution by Complexometric titration.

Requirement:

0.01 M EDTA, 10pH buffer solution and EBT

Procedure: To prepare St. Solution of 0.01 M EDTA solution in 250 measuring flask and fill the burette with it.

Dilute the given Zn solution up to 250 ml mark with distilled water.

Pipette out 25 ml of Zinc solution in conical flask. Add 5 ml 10 pH solution 5-6 drops of EBT indicator. Add 0.01 M EDTA solution from the burette dropwise till the red color of the solution changes to Blue. Repeat the titration to get constant reading.

Result:

3. Required volu. of 0.01 M EDTA for 25 ml of Zn^{+2} Solu.= _____ ml

4. The amount of Zn in given solution = _____ gm

Signature of Teacher

Preparation of standard 0.01M EDTA 250 ml Solution = 0.931 gm EDTA

Equation:

Observation:

Burette: 0.01 M EDTA

Conical Flask: 25ml dil. Ni^{+2} solu.+ 5 ml of Ammonium Chloride+ 5 ml Ammonia solution+ 5 drops of Indicator

Indicator : Muroxide

Colour Change: Yellow to Violet.

Observation Table

B.R.	P.R	1 st reading	2 nd reading	3 rd reading	Constant Reading
Final Reading					
Initial Reading					
Difference					

Calculation :

1000 ml 1 M EDTA = 58.69 gm Ni

Analytical Chemistry : Volumetric Analysis

Practical No- 6

Date:.....

Aim: To determine the amount of Ni^{+2} in given solution by Complexometric titration.

Requirement:

Nickel ion solution, 2M Ammonium Chloride, Con. Ammonia solution, Muroxide

Procedure: To prepare St. Solution of 0.01 M EDTA solution in 250 measuring flask and fill the burette with it.

Dilute the given Ni solution up to 250 ml mark with distilled water.

Pipette out 25ml of nickel ion solution into a conical flask. 5-6 drops of muroxide indicator and 5ml of 2M ammonium chloride solution. Now add con. Ammonium solution (5-8ml) drop wise until the pH of the solution becomes 7 which is shown by the yellow colour of the solution. Titrate with 0.01M EDTA until the colour changes from yellow to blush violet.

Result:

- Required volu. of 0.01 M EDTA for 25 ml of Ni^{+2} Solu. = _____ ml
- The amount of Ni in given solution = _____ gm

Signature of Teacher**Equation:****Section : 1 Normality of Brominating solution****Observation:**Burette: 0.1 N $\text{Na}_2\text{S}_2\text{O}_3$

Conical Flask: 25ml brominating solu. + 10ml of 10% KI + 5ml Conc. HCl + Indicator

Indicator : Starch solution

Colour Change: Blue to colourless.

Observation Table

B.R.	P.R	1 st reading	2 nd reading	3 rd reading	Constant Reading
Final Reading					
Initial Reading					
Difference					

Calculation :25 ml brominating solu. Required _____ ml of 0.1 N $\text{Na}_2\text{S}_2\text{O}_3$

Analytical Chemistry Estimation

Practical No- 7

Date:.....

Aim: To determine the amount of Aniline/ Phenol from given solution by bromination method.

Requirement: 0.1 N $\text{Na}_2\text{S}_2\text{O}_3$, 0.1N brominating solution, 10% KI, Starch and Con.HCl

Procedure:

Section : 2 Bromination of Aniline

Observation:

Burette: 0.1 N Na₂S₂O₃

Conical Flask: 25ml Aniline solu.+ 25 ml DW + 5 ml of Conc.HCl + _____ ml of brominating solu.

After 15 min. 20 ml of 10% KI + Indicator

Indicator : Starch solution

Colour Change: Blue to colourless.

Observation Table

B.R.	P.R	1 st reading	2 nd reading	3 rd reading	Constant Reading
Final Reading					
Initial Reading					
Difference					

Calculation :

Result:

1. Normality of Brominating solution = _____ N
2. Volume of 0.1 N brominating solu. Required for bromination of 25 ml Aniline solu.= _____ ml.
3. The amount of Aniline in given solu. = _____ gm

Signature of Teacher

Equation:

Section : 1 Normality of Iodine solution

Observation:

Burette: 0.1 N $\text{Na}_2\text{S}_2\text{O}_3$

Conical Flask: 25ml Iodine solu. + Indicator

Indicator : Starch solution

Colour Change: Blue to colourless.

Observation Table

B.R.	P.R	1 st reading	2 nd reading	3 rd reading	Constant Reading
Final Reading					
Initial Reading					
Difference					

Calculation :

25 ml Iodine solu. Required _____ ml of 0.1 N $\text{Na}_2\text{S}_2\text{O}_3$

Analytical Chemistry Estimation

Practical No- 8

Date:.....

Aim: To determine the amount of Glucose by Oxidation (Iodine) method from given solution.

Requirement:

0.1 N $\text{Na}_2\text{S}_2\text{O}_3$, 0.1N Iodine, 15% Sodium carbonate soln. Starch and 1N .HCl

Procedure:

Section : 2 Oxidation of Glucose

Observation:

Burette: 0.1 N $\text{Na}_2\text{S}_2\text{O}_3$

Conical Flask: 25ml Aniline solu.+ 5 ml 15% Na_2CO_3 + 25 ml of 0.1 N I_2 solu. After 30 min. 20 ml of 1 N HCl + Indicator

Indicator : Starch solution

Colour Change: Blue to colourless.

Observation Table

B.R.	P.R	1 st reading	2 nd reading	3 rd reading	Constant Reading
Final Reading					
Initial Reading					
Difference					

Calculation :

Result:

1. Normality of Iodine solution = _____ N
2. Volume of 0.1 N Iodine solu. Required for Oxidation of 25 ml Glucose solu.=
_____ ml.
3. The amount of Glucose in given solu. = _____ gm

Signature of Teacher