EXPERIMENT No.: 1

TO PREPARE 100ml OF 0.1N SODIUM HYDROXIDE SOLUTION.

OBSERVATIONS:

No.	Initial Burette Reading	Final Burette Reading	DIFFERENCE (Volume used)
1.	0	7	7
2.	0	6.8	6.8
3.	0	6.2	6.2
		Mean Volume Used =	6.77

CALCULATIONS:

$N_1V_1 = N_2V_2$

$0.1 \times 10 = N_2 \times 100$

$\frac{0.1 \times 10}{100} = N_2$

$N_2 = 0.150$

Now,

$N_2V_2 = N_1V_1$

$0.150 \times V_2 = 0.1 \times 100$

$V_2 = \frac{0.1 \times 100}{0.150}$

$V_2 = 66.67$

Now,

$V_2 = 100 - 66.67$

$V_2 = 33.33$ ml

Required.

EXPERIMENT No.: 2

TO PREPARE 100ml OF 0.1N ACETIC ACID.

OBSERVATIONS:

No.	Initial Burette Reading	Final Burette Reading	DIFFERENCE (Volume used)
1.	0	10.5	10.5
2.	10.5	20.5	10
3.	20	31.3	10.3
		Mean Volume Used =	10.3 ml

CALCULATIONS:

Normality of acid = N_1 = ?

Volume of Acid = V_1 = 10ml

Normality of Base = N_2 = 0.1N

Volume of Base = V_2 = 10.3ml

$N_1V_1 = N_2V_2$

$N_1 \times 10\,ml = 0.1N \times 10.3$

$N_1 = \frac{0.1N \times 10.3}{10}$

$N_1 = 0.103\,ml$ (But required normality is 0.1)

So, $N_2 = N_3$ = stock sol. prepared

Normality required = N_R = 0.1N

Volume required = V_R = 100ml

Normality of stock = N_S = 0.103ml

Vol. of stock = V_S = ?

So,

$N_SV_S = N_RV_R$

$(0.103)(V_S) = (0.1)(100)$

$V_S = \frac{(0.1)(100)}{0.103}$

$V_S = 97ml$

→ To make 100ml of 0.1N add water to 97ml

So, water added

= 100 - V_S

= 100 - 97 = 3ml water

EXPERIMENT No.: _____ Date: _____

TO PREPARE 100ml OF 0.1N HYDROCHLORIC ACID.

OBSERVATIONS:

No.	Initial Burette Reading	Final Burette Reading	DIFFERENCE (Volume used)
1.	0	15	15
2.	15	30	15
3.	30	45	15
		Mean Volume Used =	15 ml

CALCULATIONS:

Normality of Stock HCl = N_1 = ?
Volume of Stock HCl = V_1 = 10 ml
Normality of standard NaOH = N_2 = 0.1 N
Volume of Standard NaOH = V_2 = 15 ml

So, $N_1V_1 = N_2V_2$

$N_1 \times 10 = 0.1 \times 15$

$N = \frac{1.5}{10} = 0.15\,N$

So Normality of Stock HCl is 0.15 N which is more than required normality i.e 0.1 N

Normality of req. sol = N_R = 0.1 N
Volume " " " = V_R = 100 ml
Normality of Stock sol = N_s = 0.15
Volume " " " = V_s = ?

$N_sV_s = N_RV_R$

$0.15 \times V_s = 0.1 \times 100$

$V_s = \frac{10}{0.15}$

= 66.66 ml

To make 100ml sol add H_2O to stock sol

Water to be added = 100 − V_s
= 100 − 66.6
= 33.34 m

EXPERIMENT No._____ Date: _____

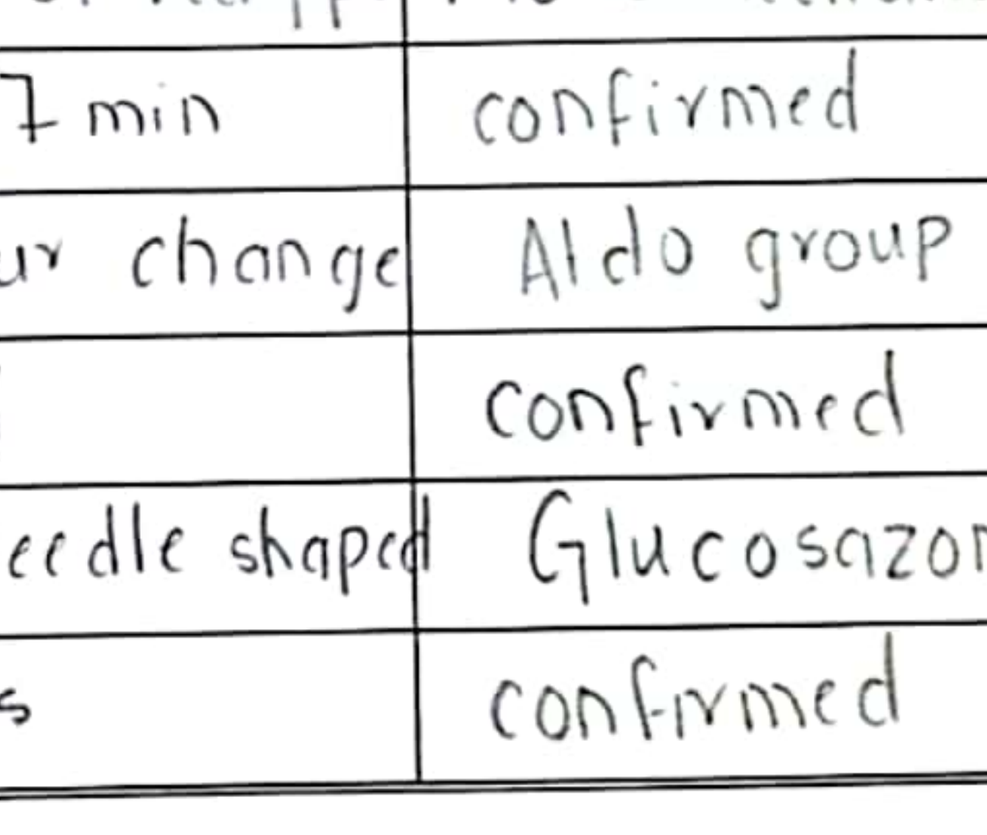
DETECTION OF GLUCOSE IN A GIVEN SOLUTION.

APPARATUS: Test tubes, Test tube holder, Test tube Rack, Pipettes, Beaker, Water bath, Burner, Glass slide, cover slip and Microscope.

REAGENTS: Molisch's Reagent, Iodine Reagent, Benedict's Reagent, Barfoed's Reagent, Seliwanoff's Reagent, Osazone Mixture, Conc. HCl, Conc. H_2SO_4, 5% NaOH & Original solution (Glucose solution).

No.	TESTS	OBSERVATION	INFERENCE
1	MOLISCH'S TEST	Reddish violet ring at the junction of two liquids	Carbohydrate confirmed
2	IODINE TEST	No colour change occur	Polysaccharide absent
3	BENEDICT'S TEST	Brick red colour	Presence of red. sugar confirmed
4	BARFOED'S TEST	formation of red. ppt before 7 min	Monosaccharide confirmed
5	SELIWANOFF'S TEST	No colour change noticed	Aldo group confirmed
6	OSAZONE TEST	Yellow, needle shaped crystals	Glucosazone confirmed

SKETCH OF THE OSAZONE CRYSTALS



RESULT: Glucose confirmed

Date: _____

EXPERIMENT No._____

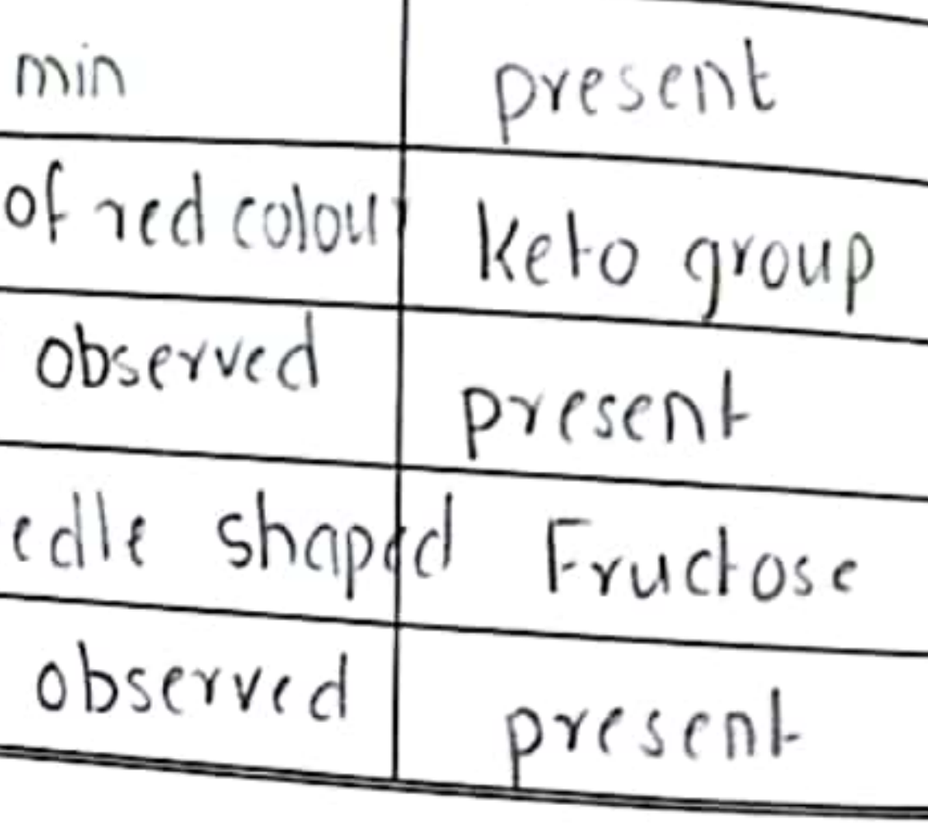
DETECTION OF FRUCTOSE IN A GIVEN SOLUTION.

APPARATUS: Test tubes, Test tube holder, Test tube Rack, Pipettes, Beaker, Water bath, Burner, Glass slide, cover slip and Microscope.

REAGENTS: Molisch's Reagent, Iodine Reagent, Benedict's Reagent, Barfoed's Reagent, Seliwanoff's Reagent, Osazone Mixture, Conc. HCl, Conc. H_2SO_4, 5% NaOH & Original solution (Fructose solution).

No.	TESTS	OBSERVATION	INFERENCE
1	MOLISCH'S TEST	Reddish violet ring appears at the junction of two liquids	Carbohydrate confirmed
2	IODINE TEST	No colour change	Absense of polysaccharide it may be mono or dissacharide
3	BENEDICT'S TEST	Red brick colour formed on heating	Reducing sugar present
4	BARFOED'S TEST	Formation of red.ppt before 7 min	Monosaccharide present
5	SELIWANOFF'S TEST	Formation of red colour precipitate observed	keto group present
6	OSAZONE TEST	Yellow needle shaped Crystals observed	Fructose present

SKETCH OF THE OSAZONE CRYSTALS



RESULT: Fructose present

EXPERIMENT No._____ Date:_____

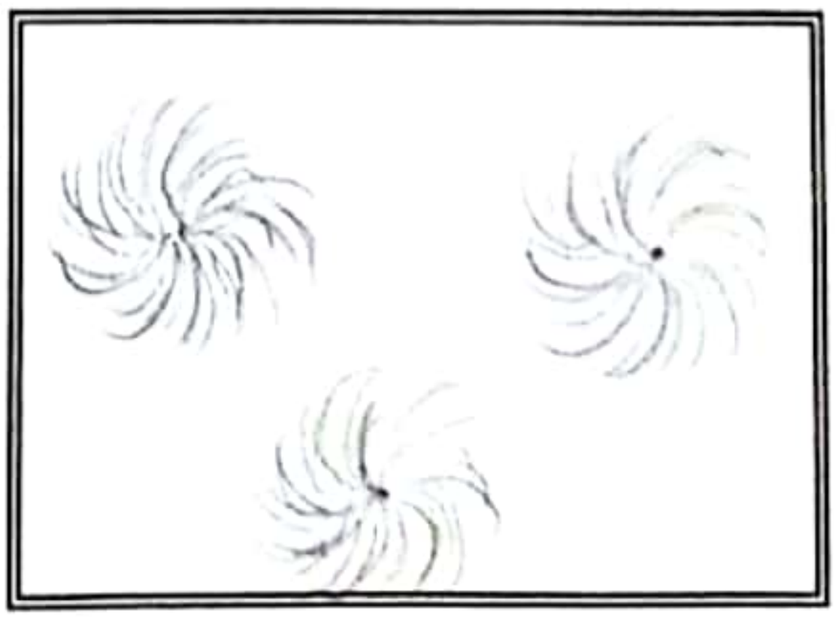
DETECTION OF GALACTOSE IN A GIVEN SOLUTION.

APPARATUS: Test tubes, Test tube holder, Test tube Rack, Pipettes, Beaker, Water bath, Burner, Glass slide, cover slip and Microscope.

REAGENTS: Molisch's Reagent, Iodine Reagent, Benedict's Reagent, Barfoed's Reagent, Seliwanoff's Reagent, Osazone Mixture, Conc. HCl, Conc. H_2SO_4, 5% NaOH & Original solution (Galactose solution).

No.	TESTS	OBSERVATION	INFERENCE
1	MOLISCH'S TEST	Reddish violet ring	Carbohydrate
		observed	present
2	IODINE TEST	No colour change	Polysaccharide
		observed	absent
3	BENEDICT'S TEST	Red-brick colour	Reducing sugar
		formed on heating	present
4	BARFOED'S TEST	Formation of red ppt	Monosaccharide
		before 7 min	present
5	SELIWANOFF'S TEST	No red ppt / colour	Aldo group
		formed	present
6	OSAZONE TEST	Fluffy ball shaped	Galactosazone
		crystals formed	Formed

SKETCH OF THE OSAZONE CRYSTALS



RESULT: Galactose present

EXPERIMENT No._____

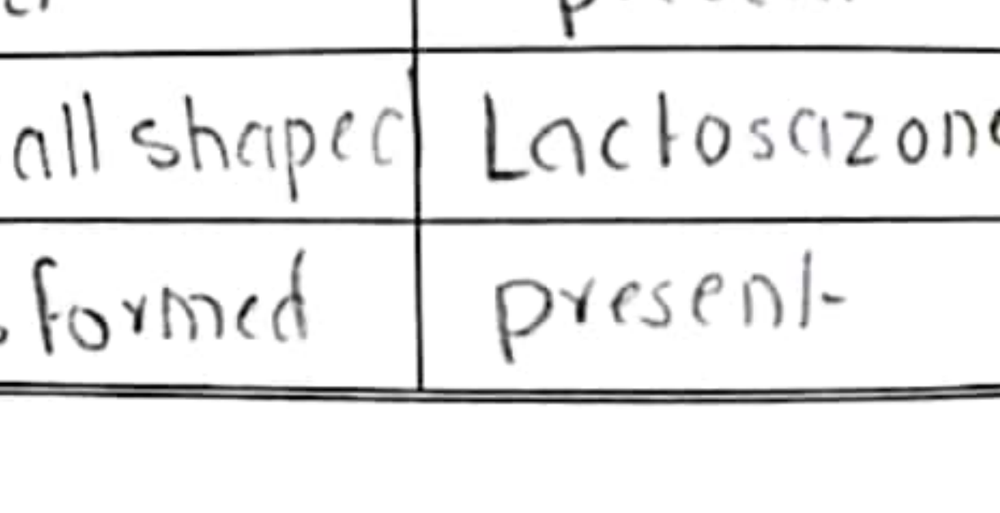
DETECTION OF LACTOSE IN A GIVEN SOLUTION.

APPARATUS: Test tubes, Test tube holder, Test tube Rack, Pipettes, Beaker, Water bath, Burner, Glass slide, cover slip and Microscope.

REAGENTS: Molisch's Reagent, Iodine Reagent, Benedict's Reagent, Barfoed's Reagent, Seliwanoff's Reagent, Osazone Mixture, Conc. HCl, Conc. H_2SO_4, 5% NaOH & Original solution (Lactose solution).

No.	TESTS	OBSERVATION	INFERENCE
1	MOLISCH'S TEST	Reddish violet ring	Carbohydrate
		formed	present
2	IODINE TEST	No blue colouration	Polysaccharide
			absent
3	BENEDICT'S TEST	Green coloured sol	Reducing
		formed on heating	sugar present
4	BARFOED'S TEST	Formation of red	Disaccharide
		ppt after 7 min	present
5	SELIWANOFF'S TEST	Red colour not	Aldo group
		formed	present
6	OSAZONE TEST	Fluffy ball shaped	Lactosazone
		crystals formed	present

SKETCH OF THE OSAZONE CRYSTALS



RESULT: Lactose present

EXPERIMENT No._____ Date:_____

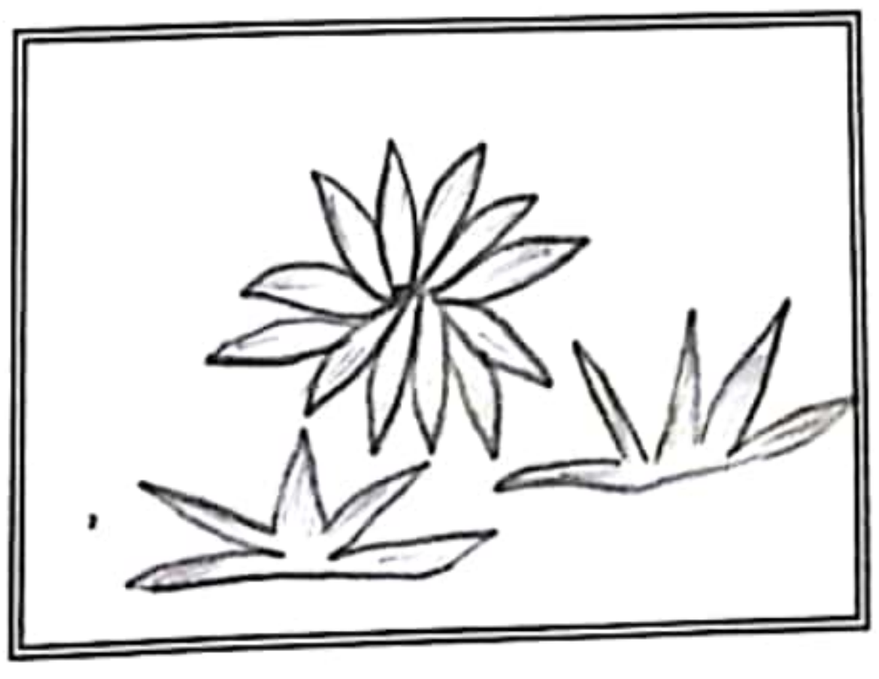
DETECTION OF MALTOSE IN A GIVEN SOLUTION.

APPARATUS: Test tubes, Test tube holder, Test tube Rack, Pipettes, Beaker, Water bath, Burner, Glass slide, cover slip and Microscope.

REAGENTS: Molisch's Reagent, Iodine Reagent, Benedict's Reagent, Barfoed's Reagent, Seliwanoff's Reagent, Osazone Mixture, Conc. HCl, Conc. H_2SO_4, 5% NaOH & Original solution (Maltose solution).

No.	TESTS	OBSERVATION	INFERENCE
1	MOLISCH'S TEST	Red violet ring formed	Carbohydrate present
2	IODINE TEST	No blue colouration observed	Polysaccharide absent
3	BENEDICT'S TEST	Olive-green colour observed on heating	Reducing sugar present
4	BARFOED'S TEST	Formation of red ppt after 7 min	Disaccharide present
5	SELIWANOFF'S TEST	Red colour not formed	Aldo group present
6	OSAZONE TEST	Sunflower shaped crystals formed	Maltose present

SKETCH OF THE OSAZONE CRYSTALS



RESULT: Maltose present

EXPERIMENT No._____

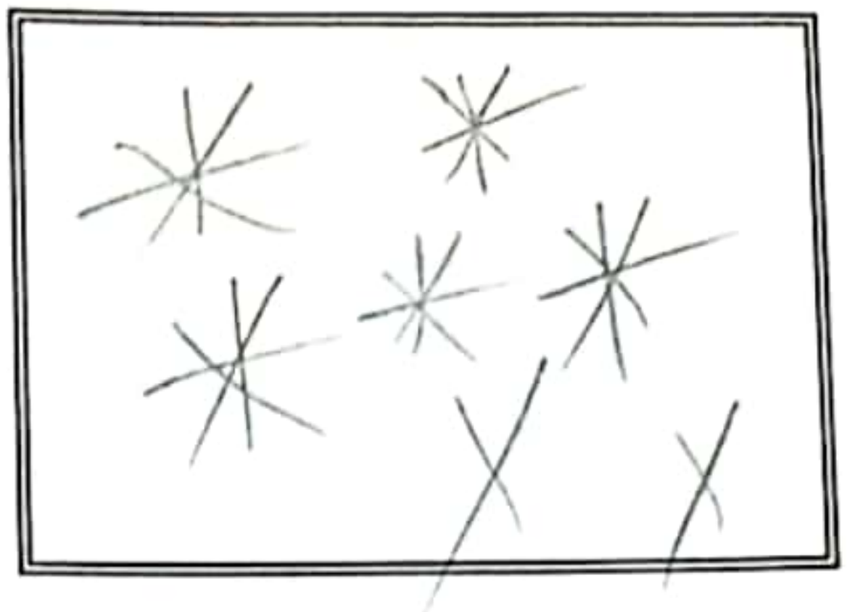
DETECTION OF SUCROSE IN A GIVEN SOLUTION.

APPARATUS: Test tubes, Test tube holder, Test tube Rack, Pipettes, Beaker, Water bath, Burner, Glass slide, cover slip and Microscope.

REAGENTS: Molisch's Reagent, Iodine Reagent, Benedict's Reagent, Barfoed's Reagent, Seliwanoff's Reagent, Osazone Mixture, Conc. HCl, Conc. H_2SO_4, 5% NaOH & Original solution (Sucrose solution).

No.	TESTS	OBSERVATION	INFERENCE
1	MOLISCH'S TEST	Formation of red violet ring	Carbohydrate present
2	IODINE TEST	No colour change observed	Polysaccharide absent
3	BENEDICT'S TEST	No colour change observed	Non-reducing sugar present
4	BARFOED'S TEST	-	-
5	SELIWANOFF'S TEST	Cherry red coloured ppt's formed	keto group present
6	PERFORM THE FOLLOWING TESTS AFTER HYDROLYSIS.		
a	BENEDICT'S TEST	Brick red colour formed	Red. sugar present
b	BARFOED'S TEST	Red ppt. observed before 7. mins	Monosaccha present
c	OSAZONE TEST	Needle shaped crystals are obse-rved	Glucose / Fructose pres

SKETCH OF THE OSAZONE CRYSTALS



RESULT: Sucrose present

EXPERIMENT No._____

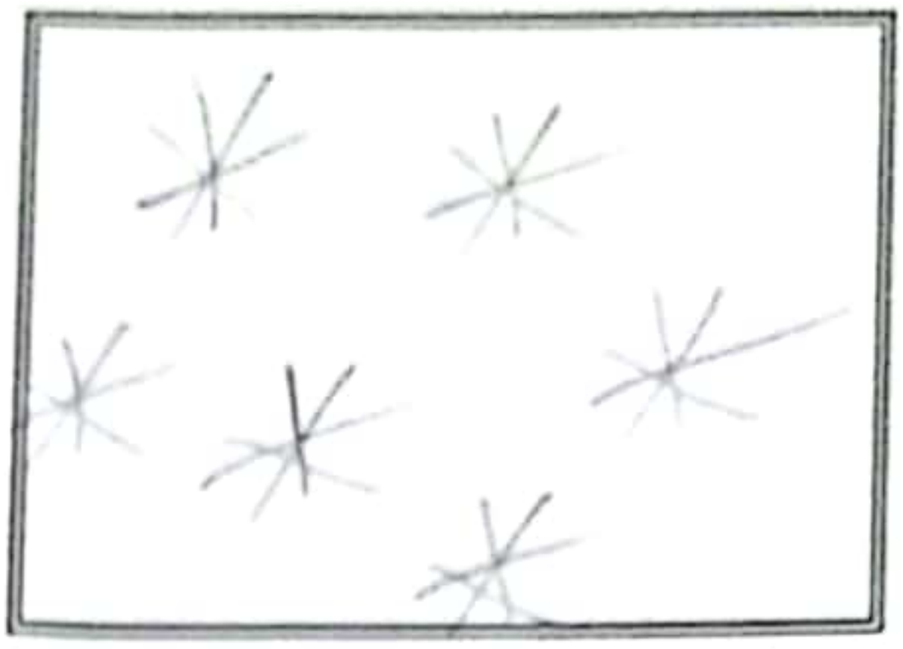
DETECTION OF STARCH IN A GIVEN SOLUTION.

APPARATUS: Test tubes, Test tube holder, Test tube Rack, Pipettes, Beaker, Water bath, Burner, Glass slide, cover slip and Microscope.

REAGENTS: Molisch's Reagent, Iodine Reagent, Benedict's Reagent, Barfoed's Reagent, Seliwanoff's Reagent, Osazone Mixture, Conc. HCl, Conc. H_2SO_4, 5% NaOH & Original solution (Starch solution).

No.	TESTS	OBSERVATION	INFERENCE
1	MOLISCH'S TEST	Reddish violet ring is formed	Carbohydrate present
2	IODINE TEST	Colour turns blue	Polysaccharide present
3	BENEDICT'S TEST	No change in colour of solution	Red sugar absent
4	BARFOED'S TEST	No ppt formed upon prolonged heating	Polysaccharide present
5	SELIWANOFF'S TEST	No change in colour	keto sugar absent
6	PERFORM THE FOLLOWING TESTS AFTER HYDROLYSIS.		
a	BENEDICT'S TEST	Brick red ppt formed	Red-sugar present
b	BARFOED'S TEST	Red ppt formed before 7 min	Monosaccharide present

SKETCH OF THE OSAZONE CRYSTALS



RESULT: Starch confirmed

Date: _____

EXPERIMENT No._____

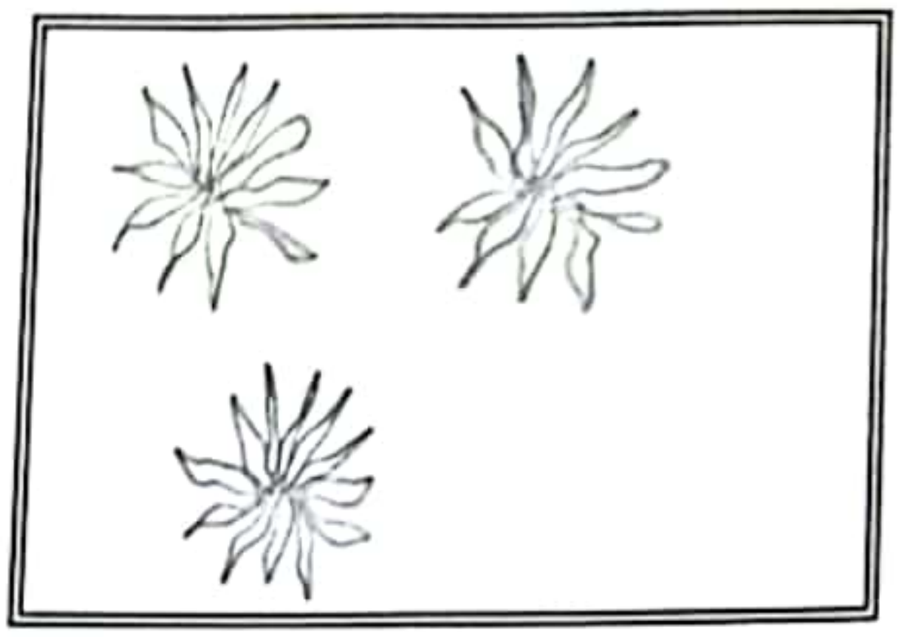
DETECTION OF UNKNOWN CARBOHYDRATE IN A GIVEN SOLUTION.

APPARATUS: Test tubes, Test tube holder, Test tube Rack, Pipettes, Beaker, Water bath, Burner, Glass slide, cover slip and Microscope.

REAGENTS: Molisch's Reagent, Iodine Reagent, Benedict's Reagent, Barfoed's Reagent, Seliwanoff's Reagent, Osazone Mixture, Conc. HCl, Conc. H_2SO_4, 5% NaOH & Original solution (Unknown Carbohydrate solution).

No.	TESTS	OBSERVATION	INFERENCE
1	MOLISCH'S TEST	Reddish violet ring	Carb
		formed	present
2	IODINE TEST	No colour	Polysaccharide
		change	absent
3	BENEDICT'S TEST	Red brick ppt	Red sugar
		formed	present
4	BARFOED'S TEST	Red ppt formed	Disaccharide
		after 7 min	present
5	SELIWANOFF'S TEST	No red colour	Keto group
		formed	absent
6	PERFORM THE FOLLOWING TESTS AFTER HYDROLYSIS OF THE UNKNOWN SOLUTION (IF REQUIRED)		
A	BENEDICT'S TEST	–	–
B	BARFOED'S TEST	–	–
C	OSAZONE TEST	Fluffy ball shaped	lactose
		crystals formed	present

SKETCH OF THE OSAZONE CRYSTALS



RESULT: Lactose present