

Index

S. No.	Name of the Experiment	Page No.	Date of Experiment	Date of Submission	Ren
01	To prepare and submit Boric acid.	01-02			
02	To prepare and submit Calcium Carbonate	03-04			
03	To perform the qualitative analysis of given sample of Aspirin.	05-06			
04	To perform the qualitative analysis of given sample of Caffeine	07-08			
05	To perform the qualitative analysis of given sample of Paracetamol.	09-10			
06	To perform the qualitative analysis of given sample of acetazolamide.	11-12			
07	To perform the qualitative analysis of given sample of chlorpromazine HCl	13-14			
08	To perform the qualitative analysis of given sample of Penicillin.	15-16			
09	To perform the qualitative analysis of given sample of ampicillin.	17-18			
10	To perform the qualitative analysis of given sample of Sulphonamide	19-20			
11	To perform the qualitative analysis of given sample of parbitalurate.	21-22			
12	To perform the qualitative analysis of given sample of glucose.	23-25			
13.	To carry out the identification test for the given sample of Urea.	26-28			

[illegible][illegible]

Aim :-

To prepare and submit Boric acid.

Reference :-

Requirements :-

Apparatus - Beaker, measuring cylinder, Glass rod, funnel, heating mantle etc.

Chemicals - Borax, H_2SO_4 (Sulphuric acid).

Theory :-

It is colourless, odourless white crystalline powder which is slightly acidic and bitter taste. Boric acid is also called hydrogen boric acid. It is a very weak acid with compound application is medium material.

Procedure :-

Dissolve about 75 gm of borax in beaker in 15 ml distilled water. Then add 4 ml H_2SO_4 slowly. Boil the solution with hot liquid. Filter to keep side for crystallization. The boric acid is formed.

Teacher's Signature : _____

Uses :-

UNITED SECULAR SOCIETY

Teacher's Signature : _____

Rupa

- Aim :- To prepare and submit calcium carbonate.
- Reference :- Gaddi is Gaddi J.J. Inorganic Pharmaceutical Chemistry IInd 7th Edition Page No. 81.
- Requirement :-
 - Apparatus :- beaker, glass, rod, filter paper.
 - Chemical :- It is a micro white crystalline powder it colourless odourless and tasteless.
It is soluble in water
It is used as antacid
- Procedure :- To take 3 gr of calcium carbonate dissolve in 50 ml water in beaker and boil the solution.
 - ↳ Now mix all the solution and allow mixture to stand mix both solution
 - ↳ precipitate of CaCO_3 is formed washed with water and dry it.

Teacher's Signature _____

Observation Table :-

Sr. No.	Experiment	Observation	Inference
1.	0.5 g sample + 10ml NaOH → Boil for 3 minutes and then cool. Then add 10ml dil. H ₂ SO ₄ and Filter. Then add water + Ferric chloride solution	Deep Violet colour	Aspirin ☐ Present ☐ Absent
2.	0.5 g sample + 10ml NaOH → Boil for 5 minutes and then cool. Then add 10ml dil. H ₂ SO ₄ and Filter. Then add 3 ml alcohol + 3 ml dil. H ₂ SO ₄ and warm	Odour of ethyl acetate	Aspirin ☐ Present ☐ Absent
3.	Melting Point	120°C	mp of Aspirin

Expt. No. 03

Date _____
Page No. 05

aim :- To perform the qualitative analysis of given sample of acetyl salicylic acid (Aspirin).
Reference :-

Requirements :-

Chemicals - Sodium hydroxide, dilute H₂SO₄ and methyl alcohol.

Apparatus - Conical Flask (100ml), beaker (250ml), measuring cylinder (100ml), glass rod, spatula, Funnel.

Theory :-

Chemically aspirin is acetyl salicylic acid and is named as α -acetoxybenzoic acid. It occurs as colourless crystals. It is odourless. Aspirin is slightly soluble in water, freely soluble in alcohol, and soluble in chloroform and ether. Aspirin is used as analgesic, anti-inflammatory and antipyretic. It melts at about 120°C.

Teacher's Signature : _____

Procedure :-

1. Boil about 0.5g of given sample with 10ml of sodium hydroxide for three minutes, Cool and add 10ml of dilute sulphuric acid. A white, crystalline precipitate is produced and the odour of acetic acid is perceptible. Filter, dissolve the precipitate in water and to the solution add Ferric chloride test solution. A deep violet colour is produced.
2. Boil about 0.5g of given sample with 10ml of Sodium hydroxide for five minutes, Cool and add 10ml of dilute sulphuric acid. A white, crystalline precipitate is produced and the odour of acetic acid is perceptible. Filter, and then add 3ml of alcohol and 3ml of H_2SO_4 to the filtrate, and warm. The odour of ethyl acetate is perceptible.
3. Determine the melting point of aspirin with the help of melting point apparatus.

Result :-

The given sample is found to be of _____
with melting point _____

Rishi

Teacher's Signature : _____

Observation Table :-

Sr. No.	Experiment	observation	Inference
1.	10mg Sample + 1ml HCl to 1g Potassium chlorate. Evaporate on water bath. Expose the residue to dil. NH_3 solution.	Purple colour appears	Caffeine ☐ Present ☐ Absent
2.	Saturated solution of sample + Few drops of Tannic acid.	White ppt	Caffeine ☐ Present ☐ Absent
3.	5 ml Sample + 1.5 ml of 0.1N iodine + few drops of dil. HCl.	Brown ppt	Caffeine ☐ Present ☐ Absent
4.	Melting Point	235-238°C	M.P. of Caffeine

Expt. No. 04

Date _____
Page No. 07

Aim:- To perform the qualitative analysis of given sample of Caffeine.

Reference:-

Requirement:-

Chemicals:- Hydrochloric acid, Potassium chlorate, ammonia, tannic acid, iodine, Sodium hydroxide.

Apparatus:- Porcelain dish, test tube, beaker (250 ml), measuring cylinder (100 ml), glass rod, spatula, Funnel etc.

Theory:-

Caffeine is 1,3,7-trimethylxanthine or its monohydrate. It forms silky white crystals or white glistening needles, or a white crystalline powder. It is odourless. The taste is bitter. It is sparingly soluble in water, and alcohol, and it is freely soluble in chloroform and boiling water. The melting point of caffeine was found to be 235-238°C.

Teacher's Signature : _____



Procedure :-

1. Take 10 mg of the sample in a porcelain dish. Add 2 ml of HCl and 0.2 g of potassium chlorate, and evaporate to dryness on a water bath. Expose the residue to the vapours of dilute ammonia solution. A purple colour, which disappears on the addition of a fixed alkali, is produced.
2. To a saturated solution of sample, add a few drops of Tannic acid solution. A white precipitate is produced which is soluble in excess of the reagent.
3. To 5 ml of a saturated solution of the sample, add 1.5 ml of 0.1 N iodine. The solution remains clear. Add a few drops of dil. HCl. A brown ppt. is formed. On neutralization with NaOH solution, the ppt. re-dissolves.
4. Measure the melting point of caffeine with the help of melting point apparatus.

Result :-

The given sample is found to be of
with melting point

Rupa

Teacher's Signature : _____

Observation Table :-

Sr. No.	Experiment	Observation	Inference
1.	0.1 g sample + 10 ml distilled water + 0.05 ml Ferric Chloride (FeCl_3) Solution.	Violet colour is produced	Paracetamol ☐ Present ☐ Absent
2.	0.25 g sample + 4 ml Pyridine + 0.5 g of 4-nitrobenzyl chloride. Boil for 2-3 min and then cool. Add mixture to 40 ml distilled water and stir.	Precipitate Forms	Paracetamol ☐ Present ☐ Absent
3.	0.1 g sample + 1 ml Conc. HCl. Boil for 2-3 minutes. No precipitate is formed. Then add 10 ml distilled water and cool. Then add 0.05 ml potassium dichromate solution.	Violet Colour is produced	Paracetamol ☐ Present ☐ Absent
4.	Melting point	169-172°C	M.P. of paracetamol

Expt. No. 05

Date _____

Page No. 09

Aim :-

To perform the qualitative analysis of given sample of paracetamol.

Reference :-

Requirement :-

Chemicals :- Ferric chloride, Conc. HCl, potassium dichromate, pyridine, nitrobenzyl chloride.

Apparatus :- Test tube, test tube stand, glass rod, beaker, measuring cylinder, burner and holder.

Theory :-

Paracetamol is 4-hydroxyacetanilide. It is white crystalline powder, sparingly soluble in water. It is a p-aminophenol derivative and is used as analgesic and antipyretic. It is kept in well closed container to protect from light. The melting point of paracetamol ranges from 169 to 172°C.

Teacher's Signature : _____



Procedure:-

1. Dissolve 0.1g of sample in 10ml of water and add 0.05 ml of ferric chloride solution. A violet colour is produced.
2. Dissolve 0.2g of sample in 4ml of pyridine solution and add 0.5g of 4-nitrobenzyl chloride solution. Boil for 2-3 minutes. Cool and pour the reaction mixture in 40 ml of water with continuous stirring. Precipitates are formed.
3. Dissolve 0.1g of sample in 1ml of conc. HCl and boil it for few minutes. No precipitates are formed. Then add 10ml of distilled water and cool the reaction mixture. Add 0.05 ml of potassium dichromate solution. Violet colour is produced.
4. Measure the melting point of paracetamol with the help of melting point apparatus.

Result:-

The given sample is found to be of _____ with the melting point.

Ref

Teacher's Signature : _____

Observation Table :-

Sr. No.	Experiment	Observation	Inference
1.	0.5g Sample + 5ml distilled water + 1ml of 10% NaOH + 0.2g Zinc powder + 0.5 ml HCl and mix	Hydrogen Sulphide evolved	Acetazolamide ☐ Present ☐ Absent
2.	25 mg Sample + 5 ml distilled water + 4 drops of 10% NaOH + 2 drops of CuSO ₄ solution	Bluish-green colour / ppt	Acetazolamide ☐ Present ☐ Absent
3.	Melting point	258-259°C	m.p. of acetazolamide

Date _____

Expt. No. 06

Page No. 11

Aim :-

To perform the qualitative analysis of given sample of acetazolamide.

Reference :-

Requirement :-

Chemicals :- Sodium hydroxide, Zinc powder, HCl, Copper Sulphate.

Apparatus :- Test tube, beaker (250ml), measuring cylinder (100ml), glass rod, spatula, Funnel.

Theory :-

Acetazolamide is a white or almost white, Crystalline powder, It is very slightly soluble in water. It belongs to the class of carbonic anhydrase inhibitor. It is a potent drug. It is used in the treatment of glaucoma and epilepsy. The melting point of acetazolamide ranges from 258-259°C.

Teacher's Signature : _____



Procedure:-

1. Triturate about 0.5g sample with 5ml of distilled water. Make it alkaline with 2ml of 10% Sodium hydroxide. Add about 0.2g of zinc powder and 0.5 ml of HCl. mix well. Hydrogen sulphide evolved, is recognized by its characteristic colour.
2. To about 25mg sample, add 5ml of distilled water, 4 drops of 10% Sodium hydroxide and 2 drops of copper sulphate solution. A bluish green colour or precipitate is produced.
3. Measure the melting point of acetoazolamide.

Result:-

The given sample is found to be of
with melting point

Rishi

Teacher's Signature : _____

Observation Table :-

Ser. No.	Experiment	Observation	Inference
1.	5g Sample + 5ml H_2SO_4 Creamy red colour is obtained To one portion of solution add 0.2 ml of 0.1N Potassium Chromate.	Brownish red colour	Chlorpromazine HCl ☒ Present ☐ Absent
2.	5mg Sample + 5ml of distilled water + 2 drop of $FeCl_3$ Solution	Stable red colour	Chlorpromazine HCl ☐ Present ☐ Absent
3.	3mg Sample + 2ml of distilled water. Acidify with dil. HNO_3 . Add 0.5 ml $AgNO_3$ Solution; Shake and allow to stand	Curdy white precipitate	Chlorpromazine HCl ☐ Present ☐ Absent
4.	Melting Point	144-146°C	M.P. of Chlorpromazine HCl

Expt. No. 07

Page No. 13

Aim :-

To perform the qualitative analysis of
given sample of chlorpromazine hydrochloride

Reference :-

Requirement :-

Chemicals :- Potassium dichromate, Ferric chloride,
dil. nitric acid, Sulphuric acid.

Apparatus :- Test tube, beaker (250ml), measuring
cylinder (100ml), glass rod, spatula,
Funnel.

Theory :-

Chlorpromazine is a tricyclic antipsychotic
drug. It is a white or creamy white powder
or waxy solid which is practically insoluble
in water. It should be kept in a well
closed container to protect from light. It
possesses antiemetic, serotonin blocking, weak
antihistaminic and local anaesthetic property.
The melting point of chlorpromazine hydrochloride
is 144-146°C.

Teacher's Signature : _____



Procedure :-

1. Dissolve 5 mg of sample in 5 ml of sulphuric acid. A cherry red colour is produced, which darkens slowly on standing. A portion of this solution on warming changes through brown to magenta. The remaining portion on addition of 0.2 ml of 0.1 N potassium chromate changes to brownish red.
2. Dissolve 5 mg of sample in 5 ml of distilled water. Add one drop of ferric chloride test solution. A stable red colour is produced.
3. Dissolve about 3 mg of sample in 2 ml of distilled water. Acidify the solution with dilute nitric acid and add 0.5 ml of silver nitrate solution. Shake and allow to stand. A curdy, white precipitate is formed. Add nitric acid. The precipitate remains insoluble. Filter out the ppt and wash with water. The ppt reappears when the solution is acidified with nitric acid.
4. Determine the melting point of given sample of chlorpromazine hydrochloride.

Result :-

The given sample is found to be of
with melting point



Teacher's Signature : _____

Observation Table :-

Experiment	Time (min)	Ampicillin, ampicillin Sodium	Benzyl Penicillin Potassium	Phenoxy methyl Penicillin Potassium
2mg Sample + 2mg Chromotropic acid Sodium Salt + 2 ml H_2SO_4 . Immerse in Oil bath at $150^\circ C$ and Shake Examine Colour at 30 seconds intervals.	0	Colourless ☐ Yes ☐ No	Yellow ☐ Yes ☐ No	Colourless ☐ Yes ☐ No
	0.5	Colourless ☐ Yes ☐ No	Yellow ☐ Yes ☐ No	Colourless ☐ Yes ☐ No
	1	Colourless ☐ Yes ☐ No	Yellow ☐ Yes ☐ No	Colourless ☐ Yes ☐ No
	1.5	Colourless ☐ Yes ☐ No	Orange - Yellow ☐ Yes ☐ No	Pale Pink ☐ Yes ☐ No
	2	Purple ☐ Yes ☐ No	Orange - Yellow ☐ Yes ☐ No	Purple ☐ Yes ☐ No
	2.5	Deep Purple ☐ Yes ☐ No	Orange - Yellow ☐ Yes ☐ No	Purple ☐ Yes ☐ No
	3	Violet ☐ Yes ☐ No	Pale Orange ☐ Yes ☐ No	Dark bluish Violet ☐ Yes ☐ No
	3.5	Violet ☐ Yes ☐ No	Orange ☐ Yes ☐ No	Dark blue ☐ Yes ☐ No
melting Point	4	Chars ☐ Yes ☐ No	-	Dark blue ☐ Yes ☐ No

Expt. No. 08

Date _____
Page No. 15

Aim :-

To perform the qualitative analysis of given sample of penicillin (Benzyl penicillin).

Reference :-

Requirement :-

Chemicals :- Chromotropic acid sodium salt, Sulphuric acid.

Apparatus :- Test tube, beaker (250ml), measuring cylinder (100ml), glass rod, spatula, Funnel.

Theory :-

Antibiotics are chemical substances produced by various species of microorganisms. Penicillin forms one of the most important groups of antibiotics. The basic structure of the penicillin consists of a thiazolidine moiety fused with a β -lactam ring. The melting point of benzyl penicillin is 24 - 27°C.

Teacher's Signature : _____

Procedure :-

To 2mg of sample, add 2mg of chromotropic acid sodium salt and 2ml of sulphuric acid. Immerse the mixture in an oil bath at 150°C . Shake the solution and examine colours at every 30 seconds intervals. Note the changes in colour and spot identify the penicillin on the basis of response listed in table below.

Time (min)	Ampicillin ampicillin sodium	Benzyl penicillin potassium	Phenoxymethyl penicillin potassium
0	Colourless	Yellow	Colourless
0.5	Colourless	Yellow	Colourless
1	Colourless	Yellow	Colourless
1.5	Colourless	Orange - Yellow	Pale pink
2	Purple	Orange - Yellow	Purple
2.5	Deep purple	Orange - Yellow	Purple
3	Violet	Pale Orange	Dark bluish violet
3.5	Violet	Orange	Dark blue
4	Chars	—	Dark blue.

Result :-

The given sample is found to be of _____ with melting point.

(Signature)

Teacher's Signature : _____

Observation Table :-

Ser. No.	Experiment	Observation	Inference
1.	Place 0.1 ml of 0.1% ninhydrin solution. Dry it at 105°C superimpose 0.1 ml of 0.1% sample solution. Heat for 5 min. at 105°C and then Cool.	Mauve Colour	Ampicillin ☐ Present ☐ Absent
2.	10 mg sample + 1 ml distilled water + 2 ml of mixture of (2 ml potassium cupritartrate + 6 ml distilled water)	Magenta violet colour	Ampicillin ☐ Present ☐ Absent
3.	Melting Point	202-208°C	m.p of ampicillin

Date _____

Expt. No. 09

Page No. 17

Aim :-

To perform the qualitative analysis of given sample of ampicillin.

Reference :-

Requirement :-

Chemicals :- Ninhydrin solution, potassium cupritartrate solution.

Apparatus :- Test tube, beaker (250 ml), measuring cylinder (100 ml), glass rod, spatula, Funnel.

Theory :-

Ampicillin belongs to the category of semi synthetic penicillin. It has broad spectrum of activity. It is a white crystalline powder, sparingly soluble in water. It dissolves in dilute solutions of acids and alkali hydroxides. It is kept in air tight container and stored at temperature not exceeding 30°C. It is used as antibacterial agent. The melting point of ampicillin was reported to be 202-208°C.

Teacher's Signature : _____



Procedure :-

1. Place 0.1 ml of a 0.1% w/v solution of ninhydrin on a filter paper. Dry it at 105°C , Superimpose 0.1 ml of a 0.1% of the sample. Heat for five minutes at 105°C , and allow cooling. A mauve colour is obtained.
2. Suspend 10mg of sample in 2ml of water. Add 2ml of a mixture of 2ml of potassium cupritartrate solution and 6ml of water. A magenta-violet colour is immediately produced.
3. Measure the melting point of ampicillin.

Result :-

The given sample is found to be of _____ with melting point _____.

(Signature)

Teacher's Signature : _____

Observation Table :-

Sr. No.	Experiment	Observation	Inference
1.	50mg Sample + 2ml dilute HCl + 2ml β -naphthol + 1g Sodium acetate	Orange ppt	Sulphonamide ☐ Present ☐ Absent
2.	1g sample + 5ml ethyl alcohol + 1ml H_2SO_4	Ethyl acetate odour	Sulphonamide ☐ Present ☐ Absent
3.	Take 500mg sample and heat for few minutes	Oily liquid with acetamide odour	Sulphonamide ☐ Present ☐ Absent
4.	1g Sample + 10ml distilled water + 2ml acetic acid.	White ppt	Sulphonamide ☐ Present ☐ Absent
5.	Melting Point	162 - 163°C	M.P. of Sulphonamide

Date _____

Expt. No. 10

Page No. 19

Aim :-

To perform the qualitative analysis of given sample of Sulphonamide.

Reference :-

Requirement :-

Chemicals :- Hydrochloric acid, β -naphthol, Sodium acetate, ethyl alcohol, H_2SO_4 .

Apparatus :- Test tube, beaker (250ml), measuring cylinder (100ml), glass rod, spatula, funnel.

Theory :-

The simplest of the sulphonamides is sulphanilamide. Chemically, it is p-amino benzene sulphonamide. Sulphonamides are bacteriostatic against a wide range of gram negative organisms. Sulphonamides are white or near white crystalline powders. They are very slightly soluble in water, but their sodium salts are freely soluble. The melting point of Sulphonamides is about 162-163°C.

Teacher's Signature : _____



Procedure:-

1. Dissolve 50mg of sample in 2ml warm dilute HCl and pour the solution in 2ml β -naphthol containing 1g sodium acetate. An orange precipitate is formed.
2. Heat the sample with ethyl alcohol and sulphuric acid. Ethyl acetate, recognizable by its odour, is produced.
3. Place 500mg of sample in a test tube, heat gently until it melts and then boil. An oily liquid which has characteristic odour of acetamide condenses on the wall of the test tube.
4. Dissolve 1g of sample in 10ml of distilled water and add 2ml of acetic acid. A white precipitate is produced. Collect the precipitate, wash with cold water, and dry it at 105°C for 4 hours. Determine the melting point of the precipitate.

Result:-

The given sample is found to be of _____ with melting point _____.

(Signature)

Teacher's Signature : _____

Observation Table :-

Ser. No.	Experiment	observation	Inference
1.	200mg sample + 10ml NaOH. Boil for few minutes	Ammonia gas is evolved	Amylobarbitone ☒ Present ☐ Absent
2.	180 mg sample + mixture of 10.5 ml of 10% of NaOH + 2 ml of 10% w/v Pyridine + 8 ml Pyridine solution + 1 ml Copper sulphate solution. Set aside for 10 minutes.	Reddish violet to green colour	Amylobarbitone ☐ Present ☐ Absent
3.	50mg sample + 2ml of 0.2% w/w Cobalt acetate solution + 2ml methanol. Warm for 2 minutes. Then add 50 mg borax and heat until it boils.	Bluish violet colour	Amylobarbitone ☐ Present ☐ Absent
4	Melting Point	160 - 168°C	M.P. of Amylobarbitone

Expt. No. 11

Date _____
Page No. 21

Aim :-

To perform the qualitative analysis of given sample of barbiturate (Amylobarbitone).

Reference :-

Requirement :-

Chemicals :- Acetic acid, Sodium hydroxide, Pyridine, Copper sulphate, Cobalt acetate, borax, Methyl alcohol.

Apparatus :- Test tube, beaker (250ml), Measuring Cylinder (100 ml), glass rod, spatula, Funnel.

Theory :-

Barbiturates is the general term used for the derivatives of barbituric acid. Chemically, barbituric acid is named as 2,4,6-Trioxo-1,3,5-dihydropyrimidine. Barbiturates are crystalline solids with very poor solubility in water. They are cyclic ureides. They are acidic because of lactam-lactim and keto-enol tautomerism. Barbiturates are used as sedative hypnotics and as an anticonvulsant.

Teacher's Signature : _____

agent. The melting point of amylbarbitone is about $160 - 168^{\circ}\text{C}$.

Procedure:-

1. Boil about 200mg of sample with 10ml of NaOH. The evolution of ammonia confirms the barbiturate nucleus.
2. Dissolve 160 mg of sample in a mixture of 0.5ml Sodium hydroxide and 10% w/v solution of 2ml pyridine. Further add 0ml of pyridine solution and 1ml of copper sulphate. Set aside for 10 minutes. A specific reddish violet to green colour is produced depending on type of barbiturate.
3. Dissolve 50mg of sample in 2ml of 0.2% w/v solution of cobalt acetate in methyl alcohol. Warm and add 50mg of powdered barax and heat to boil. A bluish-violet colour indicates the presence of barbiturates.
4. Measure the melting point of given sample of barbiturate.

Result:-

The given sample is found to be of
with melting point

[Signature]

Teacher's Signature : _____

Observation Table :-

Ser. No.	Experiment	Observation	Inference
1.	Test for nitrogen :- 2 ml Sodium Fusion extract + Few milligrams of Ferrous Sulphate	Green precipitate	Nitrogen ☐ Present ☐ Absent
2.	Test for Sulphur :- 2 ml Sodium fusion extract + few drops of Sodium nitroprusside.	Violet Colour	Sulphur ☐ Present ☐ Absent
3.	Solubility :- Take Few mg of Sample + 2 ml distilled water	Soluble in water	Glucose ☐ Present ☐ Absent
4.	Molisch test :- 0.5 g sample + 1 ml distilled water + 2 drops of 10% α -naphthol in ethanol + 1 ml Conc. H_2SO_4 . Allow to stand and then add 5 ml distilled water	Dull violet precipitate	Glucose ☐ Present ☐ Absent
5.	Barfoed's test :- 0.5 g sample + 5 ml distilled water + 1 ml Barfoed's reagent and then boil.	Red precipitate	Glucose ☐ Present ☐ Absent

Exp. No. 12

Page No. 23

Aim :-

To perform the qualitative analysis of given sample of carbohydrates (glucose).

Reference :-

Requirement :-

Chemicals :- α -Naphthol, ethyl alcohol, Conc. H_2SO_4 , Barfoed's reagent, Fehling's solution A & Fehling's solution B, Benedict's reagent.

Apparatus :- Test tube, Conical Flask (100 ml), beaker (250 ml), measuring cylinder (100 ml), glass rod, spatula, Funnel.

Theory :-

Carbohydrates are the Polyhydroxy aldehydes or Ketones or compounds which produce them on hydrolysis. They are the most abundant organic molecules in nature. They are composed of carbon, hydrogen and oxygen. Glucose belongs to the category of Monosaccharides. It is used in rehydration therapy with electrolyte soln in the prevention and treatment of dehydration. The melting point of glucose was reported to be 144-146°C.

Teacher's Signature : _____

6.	Fehling test:- Take 5ml Fehling solution (A+B) and heat. Then add 0.5g sample and boil for few minutes.	Red/ Yellow precipitate	Glucose ☐ Present ☐ Absent
7.	melting point	144-146°C	M.P. of Glucose

Expt. No.

Page No. 24

Procedure :- Detection of Elements:-

(A) Lassaigne's Test :-

Cut small pieces (3mm) of Sodium metal and lay them between the folds of Filter paper. Place one or two pieces of Sodium into ignition tube, held with a pair of tongs and add a small quantity of powdered organic compound (sample). Heat the tube gently on a Bunsen flame until the lower end of the tube becomes red hot. Boil the contents of the dish for 2 to 3 minutes and filter. The filtrate may be called as Lassaigne's extract or Sodium fusion extract.

1. Test for nitrogen :- Take 1ml of Sodium fusion extract and add few mg of Ferrous sulphate. If a greenish ppt is formed, then nitrogen is present in the sample.

2. Test for sulphur :- Take 1ml of Sodium fusion extract and add few ~~mg~~ drops of Sodium nitroprusside. If violet colour is observed, then sulphur is present in the sample.

3. Solubility test :- Mono and disaccharides are purely soluble in water. Polysaccharides are generally insoluble in water.

Teacher's Signature : _____

(b) Confirmatory Test :-

1. Molisch's test :- Place 0.5 g of the sample in a test tube and dissolve in 1 ml of water and mix it with 2 drops of a 10% soln of α -naphthol in ethyl alcohol. A dull violet ppt appears immediately, showing the presence of a Carbohydrate.
2. Barfoed's reagent test :- Dissolve 0.5 g sample in water. Add 1 ml of Barfoed's reagent and boil the soln. Formation of red cuprous oxide shows the presence of monosaccharide.
3. Fehling's reagent test :- Place 5 ml of Fehling's solution (mix equal volumes of Fehling's solution A and Fehling's solution B) in a test tube and heat to gentle boiling. Add 0.5 g of sample and continue boiling for few minutes. A red/yellow ppt of cuprous oxide indicates the presence of a reducing sugar.

Result :-

The given sample is found to be of
with melting point

Rupin

Teacher's Signature : _____

Observation Table :-

Ser. No.	Experiment	Observation	Inference
1.	Test for nitrogen :- 1 ml Sodium fusion extract + few milligram ferrous sulphate.	Green precipitate	Nitrogen ☐ Present ☐ Absent
2.	Test for sulphur :- 1 ml sodium fusion extract + few drops of sodium nitroprusside.	Violet Colour	Sulphur ☐ Present ☐ Absent
3.	Test for halogens :- 1 ml Sodium fusion extract + few drops of conc. nitric acid. Boil and then add few drops of silver nitrate solution.	White precipitate	Halogen ☐ Present ☐ Absent
4.	Sodium hydroxide Test :- Take pinch of sample + 5 ml of 10% NaOH solution and then heat.	NH_3 gas is evolved	Urea ☐ Present ☐ Absent
5.	Nitrous acid test :- 0.5 g Sodium nitrite in ice cold water + 1 ml HCl. Stand for 2 minutes and then add pinch of sample	Brisk evolution of NH_3	Urea ☐ Present ☐ Absent

Expt. No. 13

Page No. 26

Hint :-

To carry out the identification test for the given sample of urea

Reference :-

Requirement :-

Chemicals :- Sodium metal, NaOH, HCl, Sodium nitrite, Potassium hydroxide, hydroxylamine hydrochloride, Ferric chloride, ferrous sulphate.

Apparatus :- Test tube, Conical flask (100 ml), beaker (250 ml), measuring cylinder (100 ml), glass rod, spatula, funnel.

Theory :-

Urea belongs to the category of amides. The molecular formula of urea is NH_2CONH_2 . Urea is readily soluble in water. It is a diamide of carbonic acid. It forms colourless, transparent, prismatic crystals. It is slightly hygroscopic. It is stored in well closed container. Urea is used as osmotic diuretic in earlier times. It is used for the treatment of acute glaucoma & ichthyosis. The melting point of urea ranges from $131-133^\circ\text{C}$.

Teacher's Signature : _____

6.	Hydroxamic acid test :- 0.2g sample + 2ml potassium hydroxide. Boil for 4 minutes. Then add 0.2g hydroxylamine hydrochloride and acidify with dil. HCl + 2-3 drops of Ferric chloride	Red Colour	Urea ☐ Present ☐ Absent
7.	Melting Point	131-133°C	M.P. of Urea

Expt. No. _____

Page No. 27

Procedure :- Detection of Elements :-

(A) Lassaigne's Test :-

Cut small pieces (3mm) of Sodium metal and dry them b/w the folds of Filter paper. Place one or two pieces of Sodium into ignition tube, held with a pair of tongs and add a small quantity powdered organic compound (sample). Boil the contents of the dish for 2 to 3 minutes and filter. The filtrate may be called as Lassaigne's extract or Sodium Fusion extract.

1. Test for Nitrogen :-

Take 1ml of Sodium Fusion extract and add few ml of Ferric sulphate. If a greenish precipitate is formed, then nitrogen is present in the sample.

2. Test for Sulphur :-

Take 1ml of Sodium Fusion extract and add few drops of Sodium nitroprusside. If violet colour is observed, then Sulphur is present in the sample.

3. Test for halogens :-

Take 1ml of Sodium fusion extract and add few drops of conc. HNO_3 and boil. Add few drops of Silver nitrate soln. If white ppt is formed, then halogen is present in the sample.

Teacher's Signature : _____

(B) Confirmatory Test :-

1. Sodium hydroxide test :-

Heat a pinch of the given sample with sodium hydroxide soln. The evolution of ammonia gas indicates the presence of amide.

2. Nitrous acid test :-

Dissolve about 0.5 g of sodium nitrite in ice cold water and add 1 ml of HCl. Allow to stand for about 2 minutes and then add a pinch of the given sample. A brisk evolution of nitrogen gas confirms the presence of amide group.

3. Hydroxamic acid test :-

Boil about 0.1 g of given sample with 2 ml of potassium hydroxide for 4 minutes in a boiling tube. Add to it 0.2 g of hydroxylamine hydrochloride. Acidify with dil. HCl and add 2-3 drops of ferric chloride solution. Development of red colour confirms the presence of amide group.

Result :-

The given sample is found to be of _____ with melting point.

Rupam

Teacher's Signature : _____

Observation Table :-

Sr. No.	Experiment	observation	Inference
1.	Test For nitrogen :- 1ml Sodium Fusion extract + few mg Ferrous Sulphate	Green ppt	Nitrogen ☐ Present ☐ Absent
2.	Test For Sulphur :- 1ml Sodium Fusion extract + few drops of Sodium nitroprusside.	Violet Colour	Sulphur ☐ Present ☐ Absent
3.	Test For halogens :- 1ml Sodium Fusion extract + few drops of Conc. HNO_3 . Boil and then add few drops of silver nitrate solution.	White ppt	Halogen ☐ Present ☐ Absent
4.	Sulphuric acid test :- Take few ml of sample + 2ml acetic acid + 1ml Conc. H_2SO_4 . Warm on water bath. then add few ml of distilled water with continuous stirring.	Fruity odour	Ethanol ☐ Present ☐ Absent
5.	Oxidation test :- 3ml of 2% Sodium dichromate + few drops of Conc. H_2SO_4 . Shake. then add 1ml sample solution and heat for 2 minutes.	Acetaldehyde odour	Ethanol ☐ Present ☐ Absent

Date _____

Expt. No. 14

Page No. 29

~~AIM :-~~

To carry out the identification test for the given sample of alcohol (Ethanol).

Reference :-

Requirement :-

Chemicals :- Sodium metal, Conc. HNO_3 , Ferrous Sulphate, Conc. H_2SO_4 , acetic acid, Silver nitrate, Potassium iodide, iodine, 3,5-dinitrobenzoyl chloride.

Apparatus :- Test tube, Conical Flask (100ml), beaker (250ml), measuring cylinder (100ml), glass rod, spatula, Funnel.

Theory :-

Common alcohols are colourless liquids. They are neutral in reaction. Ethanol is miscible with water. Primary alcohols are oxidized to aldehydes and secondary alcohols to ketones by chromic acid. It should be stored in tightly closed containers in a cool place, away from fire and protected from moisture.

Teacher's Signature : _____



6. Iodoform test :- 5 ml sample + 2 ml of 10% NaOH + dropwise iodine solution. Heat for 15 minutes on water bath and then cool.	Yellow colour crystals	Ethanol ☐ Present ☐ Absent
7. Boiling point	76°C	B.P of ethanol

Expt. No. _____

Page No. 30

Procedure :- Detection of Elements :-

(A) LASSAIGNE'S TEST :-

1. Test for nitrogen :- Take 1 ml of Sodium fusion extract and add few mg of Ferrous sulphate. If a greenish ppt is formed, then nitrogen is present in the sample.

2. Test for sulphur :- Take 1 ml of Sodium fusion extract and add few drops of Sodium nitroprusside. If violet colour is observed, then sulphur is present in the sample.

3. Test for halogens :- Take 1 ml of Sodium fusion extract and add few drops of Conc. Nitric acid and boil. Add few drops of Silver nitrate solution. If white ppt is formed, then halogen is present in the sample.

(B) Confirmatory test :-

1. Sulphuric acid test :- Take few mg of sample, and add 2 ml acetic acid and 1 ml Conc. H_2SO_4 . Warm the solution on water bath for few minutes. Pour the content into the beaker. Add small amount of distilled water with continuous stirring. If fruity odour is observed, then given sample is ethanol.

Teacher's Signature : _____

2. Oxidation test :- In a dry test tube, add 3 ml of 2% Sodium dichromate and few drops of Conc. H_2SO_4 . Mix the contents well. Add 1 ml of sample solution and heat the content for two minutes. If the odour of acetaldehyde is produced, then the given sample is confirmed to be ethanol.
3. Iodoform test :- Take 5 ml of sample solution and add 2 ml of 10% NaOH to it. Now add iodine solution drop by drop until a slight iodine colour persists. Heat the content for 15 minutes on water bath. After 15 minutes, take out the test tube from water bath and cool. If yellow coloured crystals were obtained, then the sample contains ethanol.
4. Determine the boiling point of the sample.

Result :-

The given sample is found to be of
with boiling point

(Signature)

Teacher's Signature : _____

Observation Table :-

Ser. No.	Experiment	Observation	Inference
1.	Test for nitrogen :- 2 ml sodium fusion extract + few mg of Ferrous sulphate	Green PPT	Nitrogen ☐ Present ☐ Absent
2.	Test for sulphur :- 2 ml Sodium fusion extract + few drops Sodium nitroprusside	Violet colour	Sulphur ☐ Present ☐ Absent
3.	Test for halogens :- 2 ml Sodium Fusion extract + few drops conc. HNO_3 . Boil and then add few drops of silver nitrate solution	White PPT	Halogen ☐ Present ☐ Absent
4.	Semicarbazone test :- 0.5 g Semicarbazide HCl + 0.8 g Sodium acetate + 5 ml distilled water + 0.5 g sample. Shake and then allow to stand.	Semicarbazone Crystals appear	Benzaldehyde ☐ Present ☐ Absent
5.	Schiff's reagent test :- 0.5 g sample + 2 ml distilled water + 2 ml Schiff's reagent	Red to Purple colour appears	Benzaldehyde ☐ Present ☐ Absent

Expt. No. 15

Page No. 32

Aim :-

To carry out the identification test for the given sample of aldehyde (benzaldehyde).

Reference :-

Requirement :-

Chemicals :- Sodium metal, Semicarbazide hydrochloride, Sodium acetate, Schiff's reagent, Fehling's Solution A, Fehling's Solution B, Sodium carbonate, Benedict's reagent.

Apparatus :- Test tube, Conical flask (100 ml), beaker (250 ml), measuring cylinder (100 ml), glass rod, spatula, funnel.

Theory :-

Aldehydes are neutral compounds, Benzaldehyde is a liquid which is sparingly soluble in water. It has characteristic odour of bitter almonds. Benzaldehyde should be kept in a well filled, well closed container, protected from light and stored at a temperature not exceeding 15°C . The boiling point of benzaldehyde is $178-180^\circ\text{C}$.

Teacher's Signature : _____



6.	Fehling's solution test :- 2ml each of Fehling's soln A and B + 1ml of 10% Sodium Carbonate + 1ml Sample. Heat to boil.	Red ppt appears	Benzaldehyde ☐ Present ☐ Absent
7.	Benedict's reagent test :- 0.5g Sample + 5ml Benedict's reagent. Boil for few minutes	Red Colour appears	Benzaldehyde ☐ Present ☐ Absent
8.	Boiling Point	178-180°C	B.P. of benzaldehyde

Expt. No. _____

Date _____

Page No. 33

Procedure :- Detection of Elements :-

(A) LASSAIGNE'S TEST :-

1. Test for nitrogen :- Take 2ml of Sodium Fusion extract and add few mg of Ferrous sulphate. If a greenish precipitate is formed, then nitrogen is present in the sample.

2. Test for Sulphur :- Take 2ml of Sodium Fusion extract and add few drops of sodium nitroprusside. If violet colour is observed, then sulphur is present in the sample.

3. Test for halogens :- Take 2ml of Sodium Fusion extract and add few drops of conc. HNO_3 and boil. Add few drops of silver nitrate solution. If white ppt is formed, then halogen is present in the sample.

(B) Confirmatory Test :-

2. Semicarbazone Formation :- Dissolve 0.5g of semicarbazide hydrochloride and 0.8g of Sodium acetate in 5ml of water. Add 0.5g of the sample and shake. Allow it to

Teacher's Signature : _____

stand when crystals are formed. If necessary warm the mixture on a water bath and cool. Crystals will appear.

2. Schiff's reagent test :- Add 0.5 g of sample in water in a small test tube and to this solution add 2 ml of Schiff's reagent. A red to violet purple coloration is produced within few minutes.

3. Fehling's Solution test :- Mix 2 ml of each Fehling's Solution A and B in a test tube. In another test tube take 2 ml of sample and add 2 ml of 10% Sodium Carbonate solution. Mix the contents of both the test tubes. Heat the mixture to boil. The solution turns green from blue and on keeping red ppt of cuprous oxide slowly separates out.

4. Benedict's reagent test :- Take 0.5 g of the sample and add 5 ml of Benedict's solution. Boil for few minutes. The solution gives red colour.

Result :-

The given sample is found to be of with boiling point.

Rush

Teacher's Signature : _____