

## XII PRACTICAL GUIDE

### CHEMISTRY

### ORGANIC QUALITATIVE ANALYSIS

Name :	
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Exp no	Experiment name	Date

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S.no	Experiment	Observation	Inference
<b>Preliminary Tests</b>			
1.	<u>Odour:</u> Note the odour of the organic compound	<u>1.benzaldehyde</u> Bitter almond odour	<b>May be Benzaldehyde</b>
		<u>2.cinnamadehyde</u> No characteristics odour	Absence of aniline,phenol,ester,b enzaldehyde
		<u>3.acetophenone</u> No characteristics odour	Absence of aniline , phenol , ester , benzaldehyde
		<u>4.benzoic acid</u> No characteristics odour	Absence of aniline , phenol , ester , benzaldehyde
		<u>5.cinnamic acid</u> No characteristics odour	Absence of aniline , phenol , ester , benzaldehyde
		<u>6.urea</u> No characteristics odour	Absence of aniline , phenol , ester , benzaldehyde
		<u>7.glucose</u> No characteristics odour	Absence of aniline , phenol , ester , benzaldehyde
		<u>8.aniline</u> Fish odour	<b>May be amine</b>
		<u>9.salicylic acid</u> Phenolic odour	<b>Presence of Phenol</b>
		<u>10.benzophenone</u> No characteristics odour	Absence of aniline , phenol , ester , benzaldehyde
2.	<u>Test with litmus paper:</u> Touch the moist litmus paper with an organic compound	<u>1.benzaldehyde</u> No colour change	Absence of carboxylic acid,phenol dr amine
		<u>2.cinnamaldehyde</u> No colour change	Absence of carboxylic acid,phenol and amine

		3. <u>acetophenone</u> No colour change	Absence of carboxylic acid, phenol and amine
		4. <u>benzoic acid</u> Blue litmus to red litmus	<b>May be carboxylic acid or phenol</b>
		5. <u>cinnamic acid</u> Blue litmus to red	<b>May be carboxylic acid or phenol</b>
		6. <u>urea</u> No colour change	Absence of carboxylic acid, phenol and amine
		7. <u>glucose</u> No colour change	Absence of carboxylic acid, phenol and amine
		8. <u>aniline</u> Red litmus to blue	<b>May be amine</b>
		9. <u>salicylic acid</u> Blue litmus to red	<b>May be carboxylic acid or phenol</b>
		10. <u>benzophenone</u> No colour change	Absence of carboxylic acid
3.	<u>Action with sodium bicarbonate:</u> Take 2ml of saturated sodium bicarbonate solution in a test tube and add 2 or 3 drops of an organic compound to it	1. <u>benzaldehyde</u> No brisk effervescence	Absence of a carboxylic acid
		2. <u>cinnamaldehyde</u> No brisk effervescence	Absence of a carboxylic acid
		3. <u>acetophenone</u> No brisk effervescence	Absence of a carboxylic acid
		4. <u>benzoic acid</u> Brisk effervescence	<b>Presence of a carboxylic acid</b>
		5. <u>cinnamic acid</u> Brisk effervescence	<b>Presence of a carboxylic acid</b>
		6. <u>urea</u> No brisk effervescence	Absence of a carboxylic acid
		7. <u>glucose</u> No brisk effervescence	Absence of a carboxylic acid
		8. <u>aniline</u>	Absence of a

		No brisk effervescence	carboxylic acid
		9. <u>salicylic acid</u> No brisk effervescence	Absence of a carboxylic acid
		10. <u>benzophenone</u> No brisk effervescence	Absence of a carboxylic acid
4.	<u>Action with Borsche's reagent:</u> Take a small amount of an organic compound in a test tube. Add 3 ml of Borsche's reagent, 1 ml of Conc HCl to it, then warm the mixture gently and cool it.	1. <u>benzaldehyde</u> Yellow precipitate	<b>Presence of an aldehyde or ketone</b>
		2. <u>cinnamaldehyde</u> Yellow precipitate	<b>Presence of an aldehyde or ketone</b>
		3. <u>acetophenone</u> Red precipitate	<b>Presence of an aldehyde or ketone</b>
		4. <u>benzoic acid</u> No precipitate	Absence of an aldehyde or ketone
		5. <u>cinnamic acid</u> No precipitate	Absence of an aldehyde or ketone
		6. <u>urea</u> No precipitate	Absence of an aldehyde or ketone
		7. <u>glucose</u> Yellow precipitate	<b>Presence of an aldehyde or ketone</b>
		8. <u>aniline</u> No precipitate	Absence of an aldehyde or ketone
		9. <u>salicylic acid</u> No precipitate	Absence of an aldehyde or ketone
		10. <u>benzophenone</u> Red precipitate	<b>Presence of an aldehyde or ketone</b>
5.	<u>Charring test:</u> Take a small amount of an organic compound in a dry test tube. Add 2 ml of conc H <sub>2</sub> SO <sub>4</sub> to it, and heat the mixture.	1. <u>benzaldehyde</u> No charring	Absence of carbohydrate
		2. <u>cinnamaldehyde</u> No charring	Absence of carbohydrate
		3. <u>acetophenone</u> No charring	Absence of carbohydrate
		4. <u>benzoic acid</u> No charring	Absence of carbohydrate

		5. <u>cinnamic acid</u> No charring	Absence of carbohydrate
		6. <u>urea</u> No charring	Absence of carbohydrate
		7. <u>glucose</u> Charring takes place with smell of burnt sugar	<b>Presence of an carbohydrate</b>
		8. <u>aniline</u> No charring	Absence of carbohydrate
		9. <u>saicylic acid</u> No charring	Absence of carbohydrate
		10. <u>benzophenone</u> No charring	Absence of carbohydrate
<b>Tests for Aliphatic/Aromatic Nature</b>			
6.	<u>Ignition test:</u> Take small amount of the organic compound in a Nickel spatula and burn it in Bunsen flame.	1. <u>benzaldehyde</u> Burns with sooty flame	Presence of an aromatic compound
		2. <u>cinnamaldehyde</u> Burns with sooty flame	Presence of an aromatic compound
		3. <u>acethophenone</u> Burns with sooty flame	Presence of an aromatic compound
		4. <u>benzoic acid</u> Burns with sooty flame	Presence of an aromatic compound
		5. <u>cinnamic acid</u> Burns with sooty flame	Presence of an aromatic compound
		6. <u>urea</u> Burns with non sooty flame	<b>Presence of an aliphatic compound</b>
		7. <u>glucose</u> Burns with non sooty flame	<b>Presence of an aliphatic compound</b>
		8. <u>aniline</u> Burns with sooty flame	Presence of an aromatic compound
		9. <u>salicylic acid</u> Burns with sooty flame	Presence of an aromatic compound



		10. <u>benzophenone</u> Burns with sooty flame	Presence of an aromatic compound
<b>Tests for an Unsaturation</b>			
7.	<u>Test with bromine water:</u> Take small amount of the organic compound in a test tube add 2 ml of distilled water to dissolve it. To this solution add few drops of bromine water and shake it well.	1. <u>benzaldehyde</u> No decolourisation takes place	Substance is saturated
		2. <u>cinnamaldehyde</u> Orange-yellow colour of bromine water is decolourised	<b>Substance is unsaturated</b>
		3. <u>acetophenone</u> No decolourisation takes place	Substance is saturated
		4. <u>benzoic acid</u> No decolourisation takes place	Substance is saturated
		5. <u>cinnamic acid</u> Decolourisation takes place	<b>Substance is unsaturated</b>
		6. <u>urea</u> No decolourisation takes place	Substance is saturated
		7. <u>glucose</u> No decolourisation takes place	Substance is saturated
		8. <u>aniline</u> No decolourisation takes place	Substance is saturated
		9. <u>salicylic acid</u> No decolourisation takes place	Substance is saturated
		10. <u>benzophenone</u> No decolourisation takes place	Substance is saturated
8.	<u>Test with KMnO<sub>4</sub> solution:</u> Take small amount of the organic compound in a test tube add 2 ml of distilled water to dissolve it. To this solution add few drops of very dilute alkaline KmnO <sub>4</sub> solution and shake it well.	1. <u>benzaldehyde</u> No decolourisation takes place	Substance is saturated
		2. <u>cinnamaldehyde</u> Pink colour of KMnO <sub>4</sub> solution is decolourised.	<b>Substance is unsaturated</b>
		3. <u>acetophenone</u> No decolourisation takes place	Substance is saturated

		4. <u>benzoic acid</u> No decolourisation takes place	Substance is saturated
		5. <u>cinnamic acid</u> Decolourisation takes place	<b>Substance is unsaturated</b>
		6. <u>urea</u> No decolourisation takes place	Substance is saturated
		7. <u>glucose</u> No decolourisation takes place	Substance is saturated
		8. <u>aniline</u> No decolourisation takes place	Substance is saturated
		9. <u>salicylic acid</u> No decolourisation takes place	Substance is saturated
		10. <u>benzophenone</u> No decolourisation takes place	Substance is saturated
<b>Tests for selected functional groups</b>			
<b>Tests for aldehyde</b> <b><u>Comes for : Benzaldehyde, Cinnamaldehyde, Glucose</u></b>			
1.	<u>Tollen's reagent test:</u> Add few ml of Tollen's reagent in a clean dry test tube and add few drops of organic compound and warm the mixture for few minutes	1. <u>benzaldehyde</u> Shining silver mirror is formed	<b>Presence of an Aldehyde</b>
		2. <u>cinnamaldehyde</u> Shining silver mirror is formed	<b>Presence of an Aldehyde</b>
		3. <u>glucose</u> Shining silver mirror is formed	<b>Presence of an Aldehyde</b>
2.	<u>Fehling's Test:</u> Take few ml 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	1. <u>benzaldehyde</u> Red precipitate is formed	<b>Presence of an Aldehyde</b>
		2. <u>cinnamaldehyde</u> Red precipitate is formed	<b>Presence of an Aldehyde</b>
		3. <u>glucose</u> Red precipitate is formed	<b>Presence of an Aldehyde</b>
<b>Tests for ketones</b>			

<b>Comes for : Acetophenone , Benzophenone</b>			
1.	<u>Legal's test</u> A few amount of the organic compound then few ml of sodium nitro prusside is added and then sodium hydroxide solution is added dropwise	1. <u>acetophenone</u> Red colouration	Presece of a ketone
		2. <u>benzophenone</u> Red colouration	Presence of a ketone
<b>Test for Carboxylic acid</b> <b>Comes for : Benzoic acid , Cinnamic acid , Salicylic acid</b>			
1.	<u>Esterification Reaction:</u> Take a small amount of an solid organic compound to this , add few ml of ethyl alcohol and few drops of conc.H <sub>2</sub> SO <sub>4</sub> to it and heat the reaction mixture strongly for few minutes then pour the mixture into a beaker containing dil.sodium carbonate solution and note the smell.	1. <u>benzoic acid</u> A pleasant fruity odour is noted	Presence of carboxylic group
		2. <u>cinnamic acid</u> A pleasant fruity odour is noted	Presence of carboxylic group
		3. <u>salicylic acid</u> A pleasant fruity odour is noted	Presence of carboxylic group
<b>Tests for diamides</b> <b>Comes for : Urea</b>			
1.	<u>Biuret test:</u> Take a small amount of an organic compound and heat it strongly and cool it dissolve the residue with few ml of water then add few ml of dilute copper sulphate Solution and add few drops of 10% NaOH solution drop by drop	1. <u>urea</u> Violet colour is appeared	Presence of a diamide
<b>Test for Carbohydrates</b> <b>Comes for : Glucose</b>			
1.	<u>Molisch's test:</u> Take A small amount of an organic compound is dissolved in few ml of water. Add few drops of alpha naphthol .Then add conc H <sub>2</sub> SO <sub>4</sub> through the sides of test	1. <u>glucose</u> Violet or purple ring is formed at the junction of the two liquids.	Presence of carbohydrate
2.	<u>Osazone test:</u> Take a small amount of an organic compound in a test tube. Add	1. <u>glucose</u> Yellow crystals are obtained	Presence of carbohydrate

	1 ml of phenyl hydrazine solution and heat the mixture for about 5 minutes on a boiling water bath.		
<b>Tests for amine</b> <b>Comes for : Aniline</b>			
1.	<b>Dye Test:</b> Take A small amount of an organic substance in a clean test tube, add few ml of HCl to dissolve it. Add few crystals of NaNO <sub>2</sub> , and cool the mixture in ice bath. Then add few ml of ice cold solution of β-naphtholin NaOH.	<b>1.aniline</b> Scarlet red dye is formed	<b>Presence of an aromatic primary amine</b>
<b>Test for phenol</b> <b>Comes for : Salicylic acid</b>			
1.	<b>Neutral FeCl<sub>3</sub> test:</b> Take 1 ml of neutral ferric chloride solution is taken in a dry clean test tube. Add 2 or 3 drops (or a pinch of solid) of organic compound to it. If no colouration occurs add 3 or 4 drops of alcohol.	<b>Violet colouration is seen</b>	<b>Presence of pheno</b>

Result \ Report	
<b><u>1.benzaldehyde:</u></b> The given organic compound contains is <ul style="list-style-type: none"> <li>● Aromatic</li> <li>● Saturated</li> <li>● Functional group - Aldehyde</li> </ul>	<b><u>2.cinnamaldehyde:</u></b> The given organic compound contains is <ul style="list-style-type: none"> <li>● Aromatic</li> <li>● Unsaturated</li> <li>● Functional group - Aldehyde</li> </ul>
<b><u>3.acetophenone:</u></b> The given organic compound contains is <ul style="list-style-type: none"> <li>● Aromatic</li> <li>● Saturated</li> <li>● Functional group - Ketone</li> </ul>	<b><u>4.benzoic acid</u></b> The given organic compound contains is <ul style="list-style-type: none"> <li>● Aromatic</li> <li>● Saturated</li> <li>● Functional group-Carboxylic acid</li> </ul>
<b><u>5.cinnamic acid:</u></b> The given organic compound contains is <ul style="list-style-type: none"> <li>● Aromatic</li> </ul>	<b><u>6.urea:</u></b> The given organic compound contains is <ul style="list-style-type: none"> <li>● Aliphatic</li> </ul>

<ul style="list-style-type: none"> <li>• <b>Unsaturated</b></li> <li>• Functional group - <b>Carboxylic acid</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Saturated</b></li> <li>• Functional group - <b>Diamide</b></li> </ul>
<p><b>7.glucose:</b> The given organic compound contains is</p> <ul style="list-style-type: none"> <li>• <b>Aliphatic</b></li> <li>• <b>Saturated</b></li> <li>• Functional group - <b>Carbohydrate and aldehyde</b></li> </ul>	<p><b>8.aniline:</b> The given organic compound contains is</p> <ul style="list-style-type: none"> <li>• <b>Aromatic</b></li> <li>• <b>Saturated</b></li> <li>• Functional group - <b>Amine</b></li> </ul>
<p><b>9.salicylic acid:</b> The given organic compound contains is</p> <ul style="list-style-type: none"> <li>• <b>Aromatic</b></li> <li>• <b>Saturated</b></li> <li>• Functional group - <b>Phenol and Carboxylic acid</b></li> </ul>	<p><b>10.benzophenone:</b> The given organic compound contains is</p> <ul style="list-style-type: none"> <li>• <b>Aromatic</b></li> <li>• <b>Saturated</b></li> <li>• Functional group - <b>Ketone</b></li> </ul>

**Study well !**

**Don't be careless for practical's!**

**Respect your parents , teachers !**

***All the Best !***