

## IDENTIFICATION OF FUNCTIONAL GROUP [CARBOXYLIC ACID]

Aim: To identify the functional group present in the given organic compound.

S.NO	EXPERIMENT	OBSERVATION	INFERENCE
1.	<u>Test for unsaturation:</u> Dissolved few ml of organic compound in 2mL CCl <sub>4</sub> . Then added bromine water drop wise.	Brown color of bromine not discharged.	unsaturation absent
2.	<u>Test for Carboxylic group:</u> Added a pinch of NaHCO <sub>3</sub> to few ml of organic compound in a test tube.	Effervescence is observed	Carboxylic group may be present
3.	<u>Test for Phenolic group:</u> Added few ml of organic compound to 2-3 mL neutral FeCl <sub>3</sub> solution in a test tube.	No violet color obtained	Phenolic group is absent
4.	<u>Test for Alcoholic group:</u> Added a few drops of ceric ammonium nitrate reagent to 1ml of the given compound.	No red color obtained	Alcoholic group is absent
5.	<u>Test for Carbonyl group:</u> Added 2-3ml of 2,4 – DNP to few ml of organic compound in a test tube	No orange yellow precipitate	Carbonyl group is absent
6.	<u>Test for Amine group:</u> To a small amount of organic liquid in a test tube added 1ml of conc. HCl and few drops of CHCl <sub>3</sub> . Then added 2ml of alcohol KOH solution and warmed test tube.	No offensive smelling gas evolved	Amino group is absent

### Confirmatory test for carboxyl group:

S.NO	EXPERIMENT	OBSERVATION	INFERENCE
1.	<u>Litmus test:</u> Place a drop of the given liquid on a blue litmus paper.	Blue litmus turns to red	Presence of carboxylic group is confirmed.
2.	<u>Ester test:</u> Take a few ml of organic compound, 1ml of ethyl alcohol and 1-2 drops of conc. H <sub>2</sub> SO <sub>4</sub> in a test tube. Heat the reaction mixture on a water bath for about 5 minutes. Poured the reaction mixture in a beaker containing Na <sub>2</sub> CO <sub>3</sub> solution	A fruity smell is observed	Presence of carboxylic group is confirmed.

**RESULT:** The given organic compound contain carboxylic acid (-COOH) functional group.

## IDENTIFICATION OF FUNCTIONAL GROUP [PHENOL]

Aim: To identify the functional group present in the given organic compound.

S.NO	EXPERIMENT	OBSERVATION	INFERENCE
1.	<u>Test for unsaturation:</u> Dissolved few ml of organic compound in 2mL CCl <sub>4</sub> . Then added bromine water drop wise.	Brown color of bromine not discharged.	Unsaturation Absent
2.	<u>Test for Carboxylic group:</u> Added a pinch of NaHCO <sub>3</sub> to few ml of organic compound in a test tube.	No effervescence	Carboxylic group is absent
3.	<u>Test for Phenolic group:</u> Added few ml of organic compound to 2-3 ml neutral FeCl <sub>3</sub> solution in a test tube.	Violet color obtained	Phenolic group may be present
4.	<u>Test for Alcoholic group:</u> Added a few drops of ceric ammonium nitrate reagent to 1ml of the given compound.	No red color obtained	Alcoholic group is absent
5.	<u>Test for Carbonyl group:</u> Added 2-3ml of 2,4 – DNP to few ml of organic compound in a test tube	No orange yellow precipitate	Carbonyl group is absent
6.	<u>Test for Amine group:</u> To a small amount of organic liquid in a test tube added 1ml of conc. HCl and few drops of CHCl <sub>3</sub> . Then added 2ml of alcohol KOH solution and warmed test tube.	No offensive smelling gas evolved	Amino group is absent

### Confirmatory test for Phenol group:

S.NO	EXPERIMENT	OBSERVATION	INFERENCE
1.	<u>Litmus test:</u> Place a drop of the given liquid on a blue litmus paper.	Blue litmus turns to red	Presence of phenolic group is confirmed.
2.	<u>Lieberman's test:</u> Take a mixture of phenol and sodium nitrite in a test tube. Heat the mixture and allow it to cool. Add 1ml of Conc.H <sub>2</sub> SO <sub>4</sub>	Blue color is obtained	Presence of phenolic group is confirmed.

**RESULT:** The given organic compound contains phenolic (Ar-OH) functional group.

## IDENTIFICATION OF FUNCTIONAL GROUP [ALCOHOL]

Aim: To identify the functional group present in the given organic compound.

S.NO	EXPERIMENT	OBSERVATION	INFERENCE
1.	<u>Test for unsaturation:</u> Dissolved few ml of organic compound in 2mL CCl <sub>4</sub> . Then added bromine water drop wise.	Brown color of bromine not discharged.	Unsaturation absent
2.	<u>Test for Carboxylic group:</u> Added a pinch of NaHCO <sub>3</sub> to few mL of organic compound in a test tube.	No Effervescence	Carboxylic group is absent
3.	<u>Test for Phenolic group:</u> Added few ml of organic compound to 2-3 ml neutral FeCl <sub>3</sub> solution in a test tube.	No violet color obtained	Phenolic group is absent
4.	<u>Test for Alcoholic group:</u> Added a few drops of ceric ammonium nitrate reagent to 1ml of the given compound.	Red colour is obtained	Alcoholic group may be present
5.	<u>Test for Carbonyl group:</u> Added 2-3ml of 2,4 – DNP to few ml of organic compound in a test tube	No orange yellow precipitate	Carbonyl group is absent
6.	<u>Test for Amine group:</u> To a small amount of organic liquid in a test tube added 1ml of conc. HCl and few drops of CHCl <sub>3</sub> . Then added 2ml of alcohol KOH solution and warmed test tube.	No offensive smelling gas evolved	Amino group is absent

### Confirmatory test for alcoholic group:

S.NO	EXPERIMENT	OBSERVATION	INFERENCE
1.	Add a pellet of KOH to 1ml of liquid organic compound and warm it to dissolve KOH. Cool it and add few drops of CS <sub>2</sub> and shake.	Yellow precipitate is formed	Presence of alcohol group is confirmed.
2.	<u>Ester test:</u> 1ml of the given organic compound, 1ml of glacial acetic acid and 2-3 drops of conc. H <sub>2</sub> SO <sub>4</sub> are taken in a test tube. Warmed this mixture on a water bath for 10 minutes.	A fruity smell is observed	Presence of alcohol group is confirmed.

**RESULT:** The given organic compound contains alcoholic (R-OH) functional group.

## IDENTIFICATION OF FUNCTIONAL GROUP [ALDEHYDE]

Aim: To identify the functional group present in the given organic compound.

S.NO	EXPERIMENT	OBSERVATION	INFERENCE
1.	<u>Test for unsaturation:</u> Dissolved few ml of organic compound in 2ml CCl <sub>4</sub> . Then added bromine water drop wise.	Brown color of bromine not discharged.	Unsaturation absent
2.	<u>Test for Carboxylic group:</u> Added a pinch of NaHCO <sub>3</sub> to few ml of organic compound in a test tube.	No Effervescence is observed	Absence of carboxylic group
3.	<u>Test for Phenolic group:</u> Added few ml of organic compound to 2-3 ml neutral FeCl <sub>3</sub> solution in a test tube.	No violet color obtained	Phenolic group is absent
4.	<u>Test for Alcoholic group:</u> Added a few drops of ceric ammonium nitrate reagent to 1ml of the given compound.	No red color obtained	Alcoholic group is absent
5.	<u>Test for Carbonyl group:</u> Added 2-3ml of 2,4 – DNP to few ml of organic compound in a test tube	Orange yellow precipitate is formed	Carbonyl group present may be aldehyde (Or) ketone
6.	<u>Test for aldehyde group:</u> warmed 1ml of organic compound with Tollen's reagent	Silver mirror is obtained on the inner wall of the test tube	Aldehyde may be present
7.	<u>Test for Amine group:</u> To a small amount of organic liquid in a test tube added 1mL of conc. HCl and few drops of CHCl <sub>3</sub> . Then added 2ml of alcohol KOH solution and warmed test tube.	No offensive smelling gas evolved	Amino group is absent

### Confirmatory test for aldehyde group:

S.NO	EXPERIMENT	OBSERVATION	INFERENCE
1.	<u>Fehling test:</u> small amount of organic compound is warmed with 1mL of Fehling solution in a water bath	Red precipitate is formed	Presence of aldehyde group is conformed.
2.	<u>Schiff's test:</u> To 1ml of the organic sample add 3-4 drops of Schiff's reagent	Pink colour appears	Presence of Aldehyde group.

**RESULT:** The given organic compound contain aldehyde (-CHO) functional group.

## IDENTIFICATION OF FUNCTIONAL GROUP [KETONE]

Aim: To identify the functional group present in the given organic compound.

S.NO	EXPERIMENT	OBSERVATION	INFERENCE
1.	<u>Test for unsaturation:</u> Dissolved few ml of organic compound in 2mL CCl <sub>4</sub> . Then added bromine water drop wise.	Brown color of bromine not discharged.	Unsaturation absent
2.	<u>Test for Carboxylic group:</u> Added a pinch of NaHCO <sub>3</sub> to few mL of organic compound in a test tube.	Effervescence is observed	Carboxylic group may be present
3.	<u>Test for Phenolic group:</u> Added few ml of organic compound to 2-3 ml neutral FeCl <sub>3</sub> solution in a test tube.	No violet color obtained	Phenolic group is absent
4.	<u>Test for Alcoholic group:</u> Added a few drops of ceric ammonium nitrate reagent to 1ml of the given compound.	No red color obtained	Alcoholic group is absent
5.	<u>Test for Carbonyl group:</u> Added 2-3ml of 2,4 – DNP to few ml of organic compound in a test tube	Orange yellow precipitate is formed	Carbonyl group present may be aldehyde (Or) ketone
6.	<u>Test for aldehyde group:</u> warmed 1ml of organic compound with Tollen's reagent	Silver mirror is not formed on the inner wall of the test tube	Aldehyde group is absent
7.	<u>Sodium nitroprusside test:</u> Added sodium nitroprusside solution to few mL of organic compound. Sodium hydroxide solution is added drop wise to this mixture.	A red color is obtained	Ketone group may be present
8.	<u>Test for Amine group:</u> To a small amount of organic liquid in a test tube added 1ml of conc. HCl and few drops of CHCl <sub>3</sub> . Then added 2mL of alcohol KOH solution and warmed test tube.	No offensive smelling gas evolved	Amino group is absent

### Confirmatory test for ketone group:

S.NO	EXPERIMENT	OBSERVATION	INFERENCE
1.	Place 0.5 ml of the given liquid (or 0.5 g of solid) in a clean test-tube and add about 0.1 g of finely powdered m-dinitrobenzene. Now add about 1 ml of dilute sodium hydroxide solution and shake.	Violet color is obtained	Presence of ketone group is conformed.

**RESULT:** The given organic compound contain ketone (R- CO - R) functional group.