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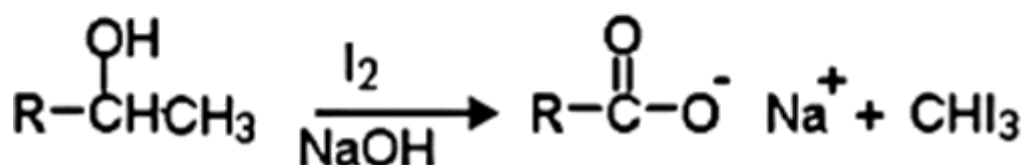
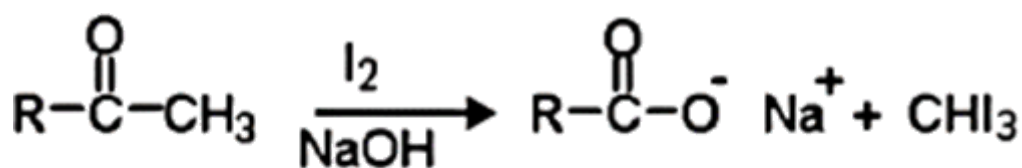
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Which Compounds Give the Iodoform Test: Iodoform Test Description (For CBSE, ICSE, IAS, NET, NRA 2022)

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- The iodoform test is a qualitative chemical test for the identification of ketones and aldehydes carrying an alpha-methyl group.
- Iodoform test is used to check the presence of carbonyl compounds with the structure $R - CO - CH_3$ or alcohols with the structure $R - CH(OH) - CH_3$ in each unknown substance.
- The reagents used in this test are iodine and sodium hydroxide. Only methyl ketones or alcohols with this feature undergo this test.
- The reaction of iodine, a base and a methyl ketone give a yellow precipitate along with an "antiseptic" smell.
- It tests positive for a few specific secondary alcohols that contain at least one methyl group in the alpha position.

Iodoform Test Description



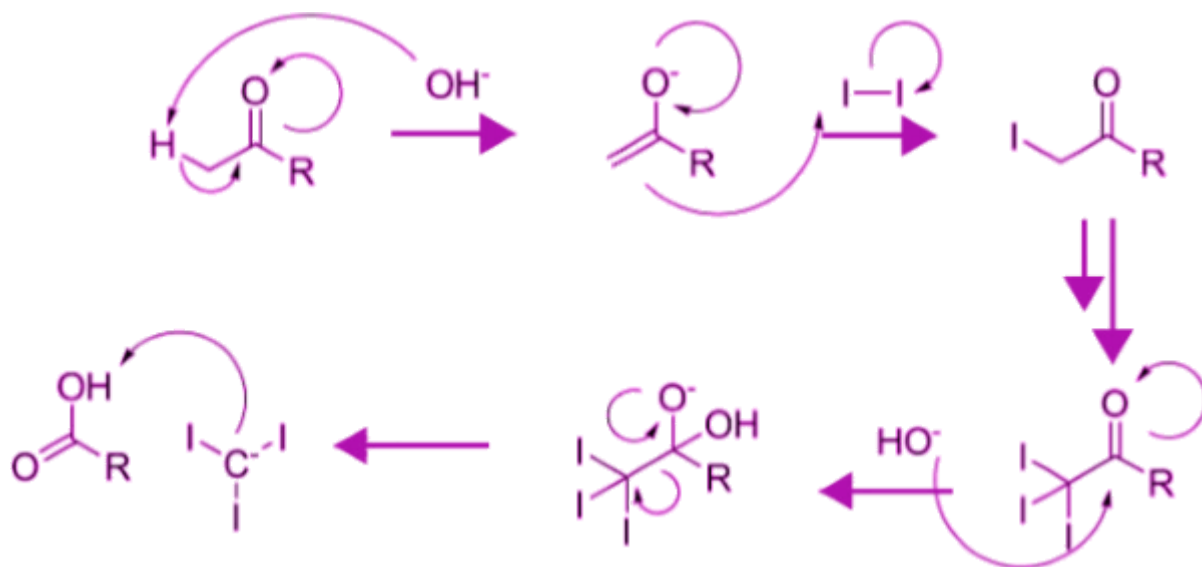
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- When Iodine and sodium hydroxide are added to a compound that contains either a methyl ketone or a secondary alcohol with a methyl group in the alpha position, a pale-yellow precipitate of iodoform or triiodomethane is formed.
- It can be used to identify aldehydes or ketones.
- If an aldehyde gives a positive iodoform test, then it must be acetaldehyde since it is the only aldehyde with a $\text{CH}_3 \text{C} = \text{O}$ group.

Compounds That Give Positive Iodoform Test

- Acetaldehyde
- Methyl Ketones
- Ethanol
- Secondary Alcohols that contain Methyl Groups in Alpha Position

Iodoform Test Mechanism



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- First, the Hydroxide ion removes an acidic alpha hydrogen. This results in the formation of an enolate ion.
- Enolate anion then goes on to displace an iodide ion from the iodine molecule.
- This process repeats twice to give $R - CO - CI_3$. Now, a hydroxide ion forms a bond with the carbonyl carbon.
- Which leads to the reformation of the carbonyl group and the elimination of the $CI_3 -$ anion?
- A $R - COOH$ group is also formed.
- The carboxylic acid group and the basic $CI_3 -$ ion neutralize each other. Thus, the iodoform is precipitated.
- So, the pale-yellow precipitate of iodoform is formed, which can be identified by its characteristic “antiseptic” smell.
- Presence of the methyl ketone is confirmed.
- The iodoform test is a very useful method to identify the presence of these methyl ketones or acetaldehyde in an unknown compound.

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