

QUALITATIVE ANALYSIS OF ALDEHYDES AND KETONES

Aldehydes and ketones constitute an important class of organic compounds containing the carbonyl group.

The following tests are used to identify the presence of aldehydes and ketones.

1. 2,4-dinitrophenylhydrazine test
2. Sodium bisulphite test

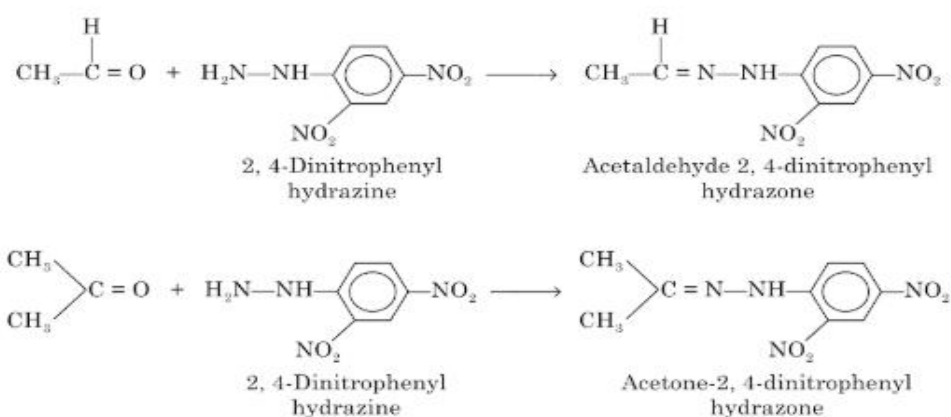
The difference between ketone and aldehyde is the carbonyl group present in aldehydes can be easily oxidized to carboxylic acids, whereas the carbonyl group in ketones is not oxidised easily. This difference in reactivity is the basis for the distinction between aldehydes and ketones. They are generally distinguished by the following tests.

1. Schiff's test
2. Fehling's test
3. Tollen's test
4. Test with chromic acid
5. Sodium nitroprusside test

1. 2,4-diphenylhydrazine Test:

- Dissolve the given organic compound in ethanol.
- To this solution, add an alcoholic solution of 2,4-dinitrophenyl hydrazine.
- Shake the mixture well.
- If there is a formation of yellow to orange precipitate then the given compound is an aldehyde or ketone.
- An orange precipitate is obtained from carbonyl compounds in which the C=O groups are conjugated with C=C.

Aldehydes and ketones react with 2,4-dinitrophenylhydrazine to give an orange-yellow precipitate.



2. Sodium bisulphite test:

- Take a saturated solution of sodium bisulphite in a clean test tube.
- Add 1ml of the given organic compound to be tested.
- Shake well and leave it for 15-20 minutes.
- If there is a formation of white precipitate, then the presence of the carbonyl group is confirmed.

Aldehydes and ketones combine with sodium bisulphite to form well-crystallized water-soluble products known as “aldehyde bisulphite” and “ketone bisulphite”.

Formation of crystalline precipitate confirms carbonyl group.

