17. Carbonyl compounds

Starter Quiz · 课前小测

A-Level Chemistry Name: _____ Score: _____

1. The difference between an aldehyde and a ketone is that:
   - ☐ the C=O is on the end of the chain in an aldehyde, and in the middle in a ketone
   - ☐ an aldehyde has no C=O group
   - ☐ a ketone has an –OH group
   - ☐ they have different molecular formulas always
2. An orange precipitate with 2,4-DNPH shows the compound is:
   - ☐ an aldehyde or a ketone (a carbonyl compound)
   - ☐ an alcohol
   - ☐ an alkane
   - ☐ a carboxylic acid only
3. Oxidising a secondary alcohol gives:
   - ☐ a ketone
   - ☐ an aldehyde
   - ☐ a carboxylic acid
   - ☐ an alkene
4. A silver mirror with Tollens' reagent indicates:
   - ☐ an aldehyde
   - ☐ a ketone
   - ☐ an alcohol
   - ☐ an alkene
5. Reducing a carbonyl compound (with $NaBH_4$) gives:
   - ☐ an alcohol
   - ☐ an alkene
   - ☐ a carboxylic acid
   - ☐ a halogenoalkane
6. Aldehydes have the carbonyl group at the end of the carbon chain.

   ☐ True ☐ False

7. Tollens' reagent gives a silver _____ with an aldehyde but not a ketone.

   _____

8. Fehling's solution turns from blue to a brick-red precipitate with:

   ☐ an aldehyde

   ☐ a ketone

   ☐ a tertiary alcohol

   ☐ an alkane

9. In the nucleophilic addition of HCN, the first step is:

   ☐ CN^- attacking the slightly positive carbonyl carbon

   ☐ the oxygen taking a proton

   ☐ the C=O bond forming

   ☐ a carbocation forming

10. A pale-yellow precipitate of CHI_3 in the iodoform test shows the compound has the:

    ☐ CH_3CO– group

    ☐ C=C bond

    ☐ –COOH group

    ☐ C–X bond

A-Level Chemistry

1. **the C=O is on the end of the chain in an aldehyde, and in the middle in a ketone**

   Both have the carbonyl C=O; in an aldehyde it is terminal (–CHO), in a ketone it is between two carbons.

2. **an aldehyde or a ketone (a carbonyl compound)**

   2,4-DNPH gives an orange precipitate with any carbonyl (aldehyde or ketone).

3. **a ketone**

   Secondary alcohols oxidise to ketones; primary alcohols (with distillation) give aldehydes.

4. **an aldehyde**

   Aldehydes are oxidised and reduce Tollens' to silver (a mirror); ketones give no change.

5. **an alcohol**

   Reduction turns a carbonyl back into an alcohol (aldehyde → primary, ketone → secondary).

6. **True**

   Ketones have it in the middle.

7. **mirror**

   Aldehydes are oxidised; ketones are not.

8. **an aldehyde**

   An aldehyde reduces Fehling's to a brick-red precipitate; a ketone does not react.

9. **CN^- attacking the slightly positive carbonyl carbon**

   The cyanide nucleophile attacks the $\delta+$ carbon, breaking the C=O; the O^- then takes an H^+.

10. **CH_3CO– group**

    The iodoform (CHI_3) test is positive for compounds containing the CH_3CO– group (and $CH_3CH(OH)$–).