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Tollens' and Fehling's Tests

1. Tollens' test

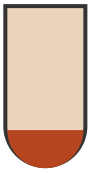
Tollens' reagent is freshly prepared ammoniacal silver nitrate. On warming, an aldehyde reduces Ag^+ to silver, which deposits on the glass as a **silver mirror**. The aldehyde is oxidised to a **carboxylate** anion.

2. Fehling's test

Fehling's solution is Fehling A (copper sulphate) plus Fehling B (alkaline sodium potassium tartrate). It is blue. On heating, an aliphatic aldehyde reduces Cu^{2+}, giving a **red-brown precipitate of Cu_2O**.



Silver mirror



Red-brown Cu_2O

3. Results

Compound	Tollens'	Fehling's
Aliphatic aldehyde	Silver mirror	Red-brown precipitate
Aromatic aldehyde	Silver mirror	No change
Ketone	No change	No change

Solved example

Q. How would you distinguish ethanal from benzaldehyde?
A. Heat each with Fehling's solution. Ethanal gives a red-brown precipitate; benzaldehyde gives no change.

Practice questions

1. (MCQ) Tollens' reagent contains (a) Cu^{2+} (b) Ag^+ (c) Fe^{3+} (d) I_2
2. (Very short) What forms on the glass in Tollens' test?
3. (Very short) Name the red-brown precipitate in Fehling's test.
4. (Short) Why do ketones not give these tests?
5. (Short) How would you distinguish ethanal from propanone?
6. (True/False) Benzaldehyde gives Fehling's test.

Answer key

1. (b).

2. A silver mirror.
3. Cu_2O.
4. They have no H on the carbonyl carbon, so they are not oxidised by these mild reagents.
5. Tollens' test: ethanal gives a silver mirror, propanone does not.
6. False.

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