Aldehyde or Ketone? The Distinguishing Tests

Two colourless compounds, both with C=O. How Tollens', Fehling's and the iodoform test tell an aldehyde from a ketone, and why they work.

Name: Date: Score: ____ / 19

A. Fill in the blanks

1. In an aldehyde the carbonyl carbon carries a ____ atom.

2. Tollens' test gives a silver ____ with aldehydes.

3. In Fehling's test aliphatic aldehydes give a brick-red precipitate of ____.

4. The yellow precipitate in the iodoform test is ____.

5. The iodoform test detects the ____ group.

B. True or False

6. Ketones are easily oxidised by Tollens' reagent. True / False

7. Benzaldehyde gives Tollens' test but generally not Fehling's test. True / False

8. Ethanal gives the iodoform test. True / False

9. In Tollens' test the aldehyde is reduced. True / False

C. Assertion and reason

10. Assertion (A): Aldehydes give Tollens' test.
Reason (R): Aldehydes are easily oxidised to carboxylate ions.

(a) Both A and R are true, and R explains A
(b) Both A and R are true, but R does not explain A
(c) A is true, R is false
(d) A is false, R is true

Answer: _____

11. Assertion (A): Propanone gives the iodoform test.
Reason (R): Propanone is an aldehyde.

(a) Both A and R are true, and R explains A
(b) Both A and R are true, but R does not explain A
(c) A is true, R is false
(d) A is false, R is true

Answer: _____

D. Choose the correct option

12. Which gives a silver mirror?

(a) propanone
(b) propanal
(c) pentan-3-one
(d) acetophenone

Answer: _____

13. Which gives the iodoform test but not Tollens' test?

(a) propanal
(b) benzaldehyde
(c) propanone
(d) methanal

Answer: _____

14. In a positive Fehling's test, Cu^{2+} is:

(a) oxidised to Cu^{3+}
(b) reduced to Cu_2O
(c) unchanged
(d) precipitated as CuO

Answer: _____

15. A compound gives Tollens' + , Fehling's – and iodoform – . It is:

(a) ethanal
(b) propanone
(c) benzaldehyde
(d) propanal

Answer: _____

E. Numerical problems

16. How many moles of Ag are deposited when 1 mol of an aldehyde reacts with Tollens' reagent?

17. Find the oxidation-state change of copper in Fehling's test.

F. Short answer questions

18. Suggest tests to distinguish propanal from propanone.

G. Match the columns

19. Match each item in Column A with the correct item in Column B.

Column A	Column B	Your answer
1. Tollens' test	(a) Reduced to Ag	1 → ____
2. Fehling's test	(b) Yellow CHI_3	2 → ____
3. Iodoform test	(c) Brick-red Cu_2O	3 → ____
4. Ag^+ in Tollens' test	(d) Silver mirror	4 → ____

Detailed solutions

1. hydrogen

2. mirror

3. Cu_2O

4. CHI_3

5. $CH_3CO–$

6. False. Ketones resist mild oxidation.

7. True. Aromatic aldehydes do not reduce Fehling's solution.

8. True. It has a $CH_3CO–$ group.

9. False. The aldehyde is oxidised; Ag^+ is reduced.

10. (a) R explains A.

11. (c) A is true; propanone is a ketone.

12. (b) propanal. Propanal is an aldehyde.

13. (c) propanone. A methyl ketone.

14. (b) reduced to Cu_2O. Copper(II) to copper(I).

15. (c) benzaldehyde. An aromatic aldehyde.

16. $RCHO + 2[Ag(NH_3)_2]^+ + 3OH^- \rightarrow RCOO^- + 2Ag + 4NH_3 + 2H_2O$. **Answer: 2**

17. Cu^{2+} (+2) $\rightarrow$ Cu_2O (+1). **Answer: 1**

18. Tollens': propanal gives a silver mirror, propanone does not (also Fehling's: propanal brick red; iodoform: propanone yellow CHI_3).

19. 1 → (d), 2 → (c), 3 → (b), 4 → (a). Each test matches its positive sign.