

CBSE Class 12 Chemistry Chapter 12 Aldehydes, Ketones, and Carboxylic Acids Worksheet with Answer– Set 3

Q1. Which of the following compound can be oxidised to prepare ethyl methyl ketone?

- (a) Propanal
- (b) Butanal
- (c) Tertiary butyl alcohol
- (d) None of the above

Answer:

(c) Tertiary butyl alcohol can be oxidised to prepare ethyl methyl ketone.

Q2. Acetaldehyde on the treatment of a few drops of sulphuric acid gives

- (a) Paraldehyde
- (b) Ethyl methyl amine
- (c) Ethyl alcohol
- (d) None of the above

Answer:

Acetaldehyde on the treatment of a few drops of sulphuric acid gives paraldehyde.

Q3. The enolic form of acetone contains

- (a) 9 sigma bonds, 1 pi bond and 2 lone pairs
- (b) 8 sigma bonds, 2 pi bonds and 2 lone pairs
- (c) 10 sigma bonds, 1 pi bond and 1 lone pair
- (d) 9 sigma bonds, 2 pi bonds and 1 lone pair

Answer:

(a) The enolic form of acetone contains 9 sigma bonds, 1 pi bond and 2 lone pairs.

Q4. Methyl ketones are categorised through

- (a) The tollen's reagent,
- (b) The iodoform test
- (c) The Benedict test
- (d) None of the above

Answer:

(b) Methyl ketones are categorised through the iodoform test.

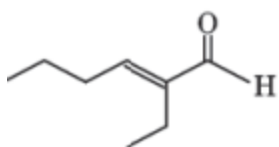
Q5. Schiff's reagent is

- (a) Decolourisation of magenta solution with sulphurous acid
- (b) Decolourisation of magenta solution with chlorine
- (c) Ammonical cobalt chloride solution
- (d) Ammonical manganese sulphate solution

Answer:

(a) Schiff's reagent is decolourisation of magenta solution with sulphurous acid.

Q6. Write the IUPAC name of the compound mentioned below.



Answer:

The IUPAC name of the compound mentioned above is 2- Ethyl Hex-2-enal.

Q7. Write the IUPAC and common name of $(\text{CH}_3)_3 \text{C CHO}$.

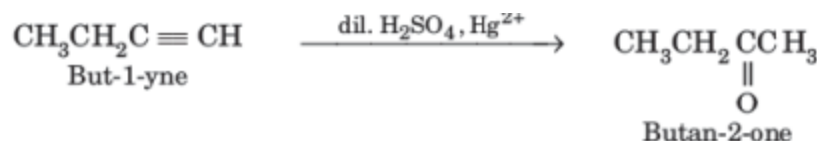
Answer:

The IUPAC and common name of $(\text{CH}_3)_3 \text{C CHO}$ is 2,2 Dimethyl propanal and α, α - Dimethyl propionaldehyde.

Q8. How will you convert butyne to butan-2-one?

Answer:

We can convert butyne to butan-2-one by reacting it with sulphuric acid in the presence of the amalgam.



Q9. Name the reagents that can be used to bring about the following conversion.

- Hexanol to hexanal
- Cyclohexanol to cyclohexanone
- 4- Fluoro toluene to 4- Fluoro benzaldehyde

Answer:

The reagent that can be used to bring about the following conversion are mentioned below.

- Hexanol to hexanal:** PCC in Di chloro methane
- Cyclohexanol to cyclohexanone:** Acidified K₂Cr₂O₇ solution
- 4- Fluoro toluene to 4- Fluoro benzaldehyde:** CrO₃ in the presence of the acetic anhydride.

Q10. What is the difference between a carbon-carbon double bond and a carbon-oxygen double bond?

Answer:

The primary difference between a carbon-carbon double bond and a carbon-oxygen double bond is mentioned below.

- Carbonyl group is polar in nature, while the ethylenic double bond is non-polar.
- The carbonyl group shows resonance, while there is no resonance in the case of an ethylenic double bond.

Q11. Arrange the following carbonyl compounds in order of reactivities in the nucleophilic addition reaction.

Ethanal, propanal, propanone, and butanone.

Answer:

We can arrange the above carbonyl compounds in order of reactivities in the nucleophilic addition reaction as Ethanal > Propanal > Propanone > Butanone.

It is due to the fact that the electron-donating inductive effect and steric hindrance around the carbonyl group increase leading to the decrease in the reactivity.

Q12. Why is benzaldehyde less reactive than propanal?

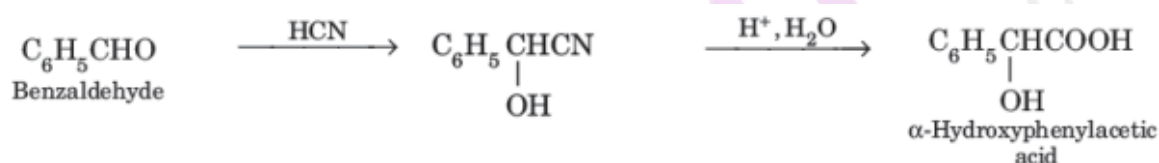
Answer:

Benzaldehyde is less reactive than propanal because the carbon atom of the carbonyl group of benzaldehyde is less electrophilic than the carbon atom of the carbonyl group in the propanal. This is because the polarity of the carbonyl group is decreased in benzaldehyde due to resonance. Therefore, benzaldehyde is less reactive than propanal.

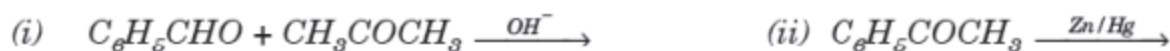
Q13. Convert benzaldehyde to α -Hydroxy phenylacetic acid.

Answer:

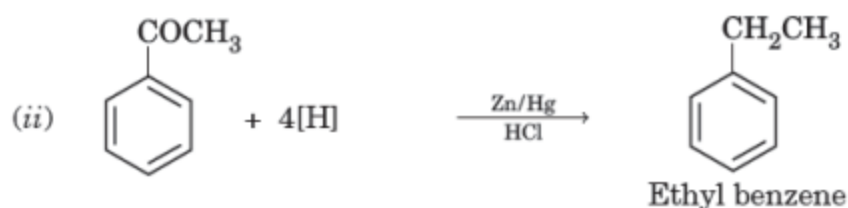
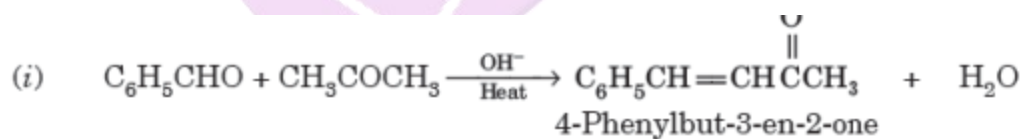
We can convert benzaldehyde to α -Hydroxy phenylacetic acid by reacting it with hydrogen cyanide, followed by hydrolysis in the acidic medium.



Q14. Complete the reaction.



Answer:

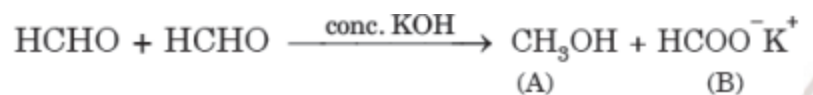


Q15. Identify A and B in the following reaction.



Answer:

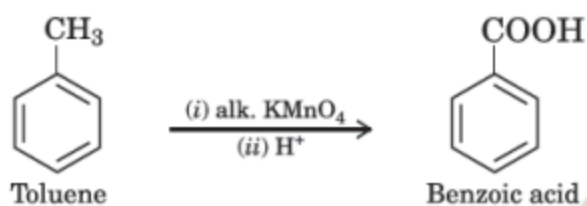
Here, A is methanol, and B is potassium methanoate.



Q16. Convert toluene to benzoic acid.

Answer:

We can convert toluene to benzoic acid by reacting it with alkaline potassium permanganate in the acidic medium.



Q17. Which Grignard reagent would be used to make the following conversions.

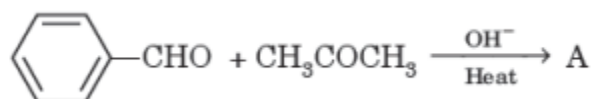
- (a) Acetophenone to 2-Phenyl-2-butanol.
- (b) Cyclohexanone to 1-Propylcyclohexanol.

Answer:

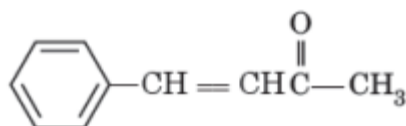
We can use the following Grignard reagent to make the following conversions.

- (a) **Acetophenone to 2-Phenyl-2-butanol:** Ethylmagnesium bromide.
- (b) **Cyclohexanone to 1-Propylcyclohexanol:** Propylmagnesium bromide.

Q18. Identify A in the following reaction.



Answer:



Here, A is

Q19. An unknown aldehyde 'A' on reacting with alkali gives a β -hydroxy-aldehyde, which loses water to form an unsaturated aldehyde, 2-butenal. Another aldehyde, B, undergoes a disproportionation reaction in the presence of conc. alkali to form products C and D. C is aryl alcohol with the formula C_7H_8O .

(a) Identify A and B.

(b) Write the sequence of reactions involved.

(c) Name the product when 'B' reacts with zinc amalgam and hydrochloric acid.

Answer:

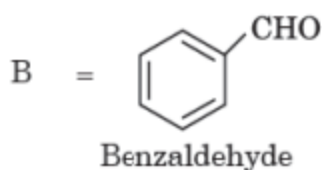
(i) The aldehyde compound 'A' on reacting with alkali gives a β -hydroxy aldehyde which loses water to form unsaturated aldehyde, but-2-enal. This is an aldol condensation reaction.

(ii) The aldehyde compound B undergoes a disproportionation reaction with concentrated alkali. This is Cannizzaro's reaction.

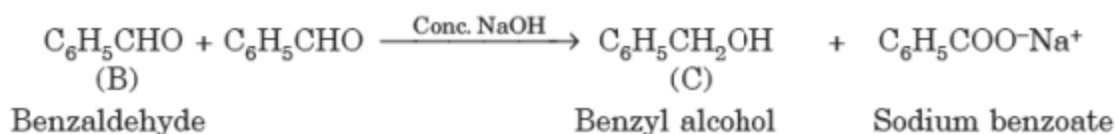
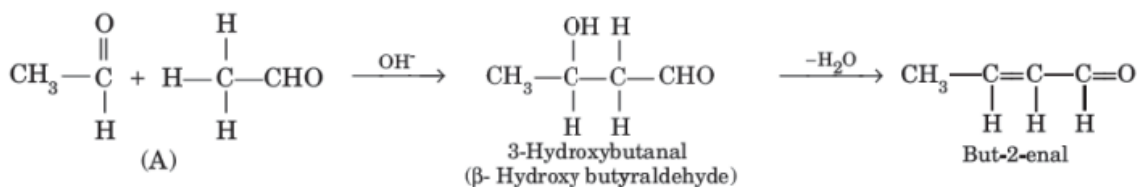
(iii) Product C is aryl alcohol with the formula C_7H_8O . It must be $C_6H_5CH_2OH$ and is formed by condensation of benzaldehyde. Thus,

(a) A = CH_3CHO (Ethanal)


B = Benzaldehyde




(b) Sequence of reactions involved:



(c) The product formed when 'B' reacts with zinc amalgam and hydrochloric acid is toluene.

(A)  CC(=O)c1ccccc1
Methylphenyl ketone

And

(B)  OC(=O)c1ccccc1
 $C_7H_6O_2$