

CBSE 12th Chemistry Chapter- 12

(Aldehydes, Ketones and Carboxylic Acids)

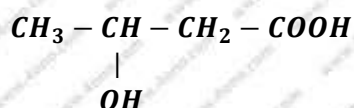
Unsolved Important Questions

SECTION A

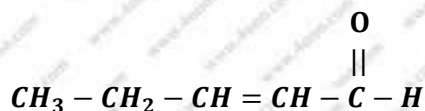
(Each question in this section carry 1 mark)

Q.1. Draw the structural formula of 1-phenyl Propan-1-one molecule.

Q.2. Write the IUPAC name of the compound.



Q.3. Write the IUPAC name of the following compound:

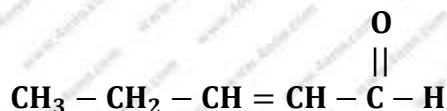


Q.4. Write the structural formula of 1 – phenylpentan – 1 – one.

Q.5. Draw the structure of 4-chloropentan-2-one.

Q.6. What happens when bromine attacks $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{C} = \text{CH}$?

Q.7. Write the IUPAC name of the following compound:



Q.8. Write the structure of p-methyl benzaldehyde.

SECTION B

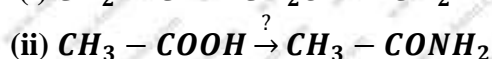
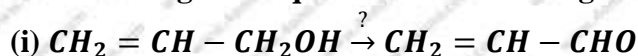
(Each question in this section carry 2 marks)

Q.9. Write the equations involved in the following reactions:

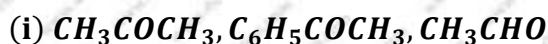
(i) Wolff-Kishner reduction

(ii) Etard reaction

Q.10. Write the reagents required in the following reactions:



Q.11. Arrange the following compounds in increasing order of their property as indicated:



(reactivity towards nucleophilic addition reaction)



Q.12 (b) Give simple chemical tests to distinguish between the following pairs of compounds:

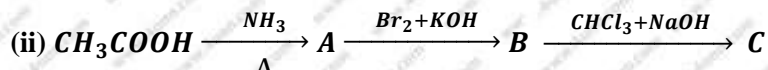
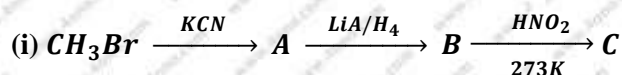
(i) Ethanal and Propanol

(ii) Benzoic acid and Phenol

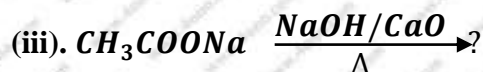
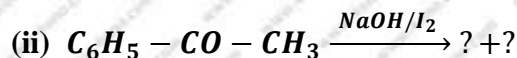
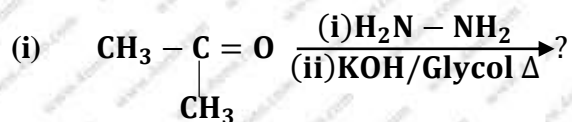
SECTION C

(Each question in this section carry 3 marks)

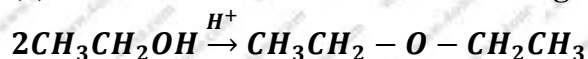
Q.13. Give the structure of A, B and C in the following reactions:



Q.14. Predict the products of the following reactions:

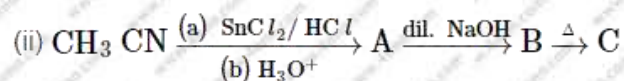
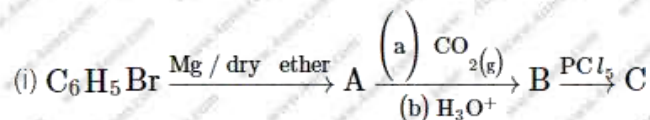


Q.15. (a) Write the mechanism of the following reaction:



(b) Write the equation involved in the acetylation of Salicylic acid.

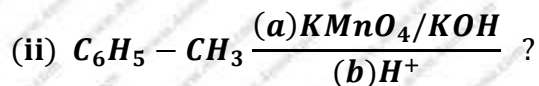
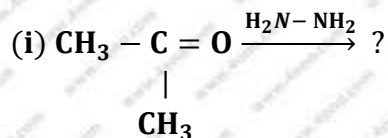
Q.16. Write structures of compounds A, B and C in each of the following reactions:



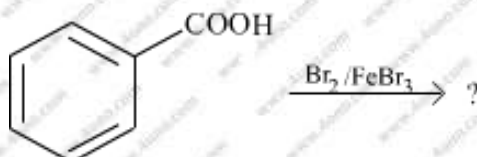
Q.17. Do the following conversions in not more than two steps:

- (i) Benzoic acid to benzaldehyde
- (ii) Ethyl benzene to Benzoic acid
- (iii) Propanone to Propene

Q.18. Predict the products of the following reactions:



(iii)



SECTION D

(Each question in this section carry 5 marks)

Q.19. (a) How would you account for the following:

- (i) Aldehydes are more reactive than ketones towards nucleophiles.
- (ii) The boiling points of aldehydes and ketones are lower than of the corresponding acids.
- (iii) The aldehydes and ketones undergo a number of addition reactions.

(b) Give chemical tests to distinguish between:

- (i) Acetaldehyde and benzaldehyde
- (ii) Propanone and propanol

Q.20. (a) Illustrate the following name reactions by giving example.

- (i) Connizzaro's reaction
- (ii) Clemmensen reduction

(b) An organic compound A contains 69.77% carbon, 11.63% hydrogen and rest oxygen. The molecular mass of the compound is 86. It does not reduce Tollen's reagent but forms an addition compound with sodium hydrogen sulphite and gives positive iodoform test. On vigorous oxidation it gives ethanoic and propanoic acid. Derive the possible structure of compound A.

Q.21. (a) How are the following obtained?

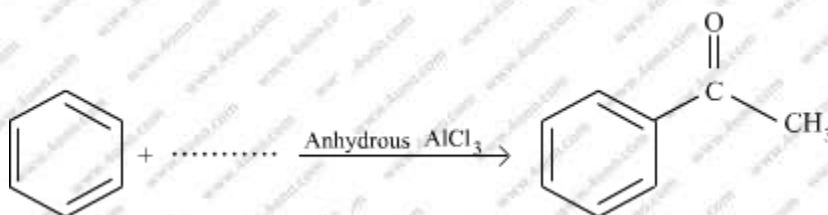
(i) Benzoic acid from ethyl benzene.

(ii) Benaldehyde from toluene.

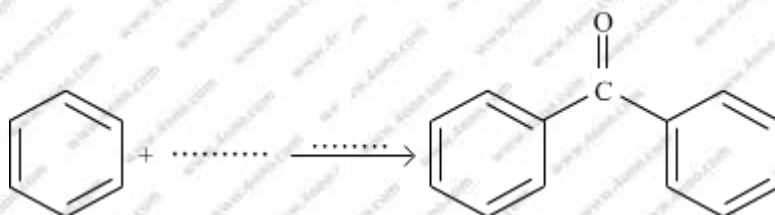
(b) Complete each synthesis by giving the missing material, reagent or products:



(ii)



(iii)



Q.22. Illustrate the following name reactions giving suitable example in each case:

(i) Clemmensen reduction

(ii) Hell-Volhard-Zelinsky reaction

(b) How are the following conversions carried out?

(i) Ethylecyanide to ethanoic acid.

(ii) Butanol to Butanoic acid

(iii) Benzoic acid to m-bromobenzoic acid

Q.23. (a) Illustrate the following reactions suitable example for each.

(i) Cross aldol condensation

(ii) Decarboxylation

(b) Give simple tests to distinguish between the following pairs of compounds

(i) Pentan-2-one and pentan-3-one

(ii) Benaldehyde and acetophenone

(iii) Phenol and benzoic acid

Q.24. (a) Although pentoxide ion has more number of resonating structures than Carboxylate ion, Carboxylic acid is a stronger acid than phenol. Give two reasons.

(b) How will you bring about the following conversions?

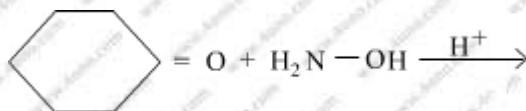
(i) Propanone to propanol

(ii) Benzoyl Chloride to benzaldehyde

(iii) Ethanal to but-2-enal

Q.25. (a) write the products of the following reactions:

(i)



(ii) $2C_6H_5CHO + conc. NaOH \rightarrow$

(iii) $CH_3COOH \xrightarrow{Cl_2/P}$

(b) Give simple chemical tests to distinguish between the following pairs of compounds:

(i) Benzaldehyde and benzoic acid,

(ii) Propanal and propanone.

Q.26. (a) Account for the following:

(i) CH_3CHO is more chemically reactive than CH_3COCH_3 towards reaction with HCN.

(ii) Carboxylic acid is a stronger acid than phenol.

(b) Write the chemical equations to illustrate the following name reactions:

(i) Wolff-Kirsher reduction

(ii) Aldol condensation

(iii) Cannizzaro reaction

Q.27. (a) How will you convert the following:

(i) Propanone to Propan-2-ol

(ii) Ethanal to 2-hydroxy propanoic acid

(iii) Toluene to benzoic acid

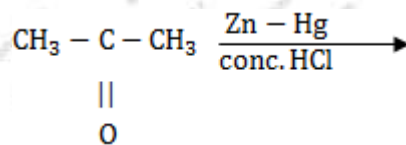
(b) Give simple chemical test to distinguish between:

(i) Pentan-2-one and Pentan-3-one

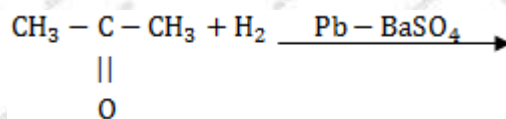
(ii) Ethanal and Propanal

Q.28. (a) Write the products of the following reactions:

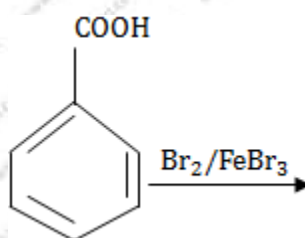
(i)



(ii)



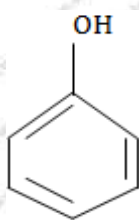
(iii)



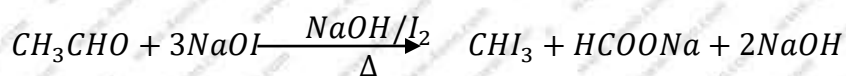
(b) Which acid of each pair shown here would you expect to be stronger.

(i) $\text{F} - \text{CH}_2 - \text{COOH}$ or $\text{Cl} - \text{CH}_2 - \text{COOH}$

(ii)



or CH_3COOH



Ethanol

(yellow ppt.)

Q.29. (a) Giving a chemical equation for each, illustrate the following processes:

(i) Cannizzaro reaction

(ii) Acetylation

(iii) Decarboxylation

(b) State chemical tests to distinguish between the following pairs of compounds:

- (i) Propanal and Propanone
- (ii) Phenol and Benzoic acid

Q.30. (a) Write chemical equations to illustrate the following name bearing reactions:

- (i) Cannizzaro's reaction
- (ii) Hell-Volhard-Zelinsky reaction

(b) Give chemical tests to distinguish between the following pairs of compounds:

- (i) Propanal and Propanone
- (ii) Acetophenone and Ben-Zophenone
- (iii) Phenol and benzoic acid.

Q.31. (a) How will you bring about the following conversions:

- (i) Ethanol to 3-hydroxybutanal (ii) Benzaldehyde to Benzophenone

(b) An organic compound A has the molecular formula $C_8H_{16}O_2$. It gets hydrolyzed with dilute sulphuric acid and gives a carboxylic acid B and an alcohol C. Oxidation of C with chromic acid also produced B. C on dehydration reaction gives but-1-ene. Write equations for the reactions involved.

Q.32. (a) Illustrate the following name reactions giving a chemical equation in each case:

- (i) Clemmensen reaction
- (ii) Cannizzaro's reaction

(b) Describe how the following conversions can be brought about:

- (i) Cyclohexene to cyclohexene 1-one
- (ii) Ethyl Benzene to benzoic acid
- (iii) Bombazine to benzoic acid .

Q.33. (a) Illustrate the following name reactions:

- (i) Hell - Volhard - Zelinsky reaction
- (ii) Wolff - Kishner reduction reaction

(b) How are the following conversions carried out:

- (i) Ethyl Cyanide to ethanoic acid
- (ii) Butan-1-ol to butanoic acid
- (iii) Methylbenzene to benzoic acid

Write chemical equations for the involved reactions.

Q.34. (a) Illustrate the following name reactions:

- (i) Cannizzaro's reaction
- (ii) Clemmensen reduction

(b) How would you obtain the following:

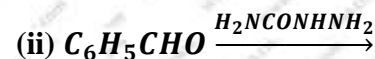
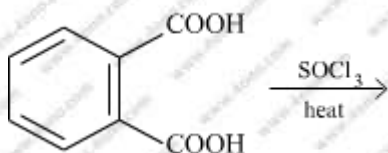
- (i) But-2-enal from ethanal
- (ii) Butanoic acid from butanol
- (iii) Benzoic acid from ethylbenzene

Q.35. (a) Give chemical tests to distinguish between the following:

- (i) Benzoic acid and ethyl benzoate
- (ii) Benzaldehyde and acetophenone.

(b) Complete each synthesis by giving missing reagents or products in the following:

(i)



(iii)



Q.36. (a) write a suitable chemical equation to complete each of the following transformations:

- (i) Butan-1-ol to butanoic acid
- (ii) 4-Methylacetophenone to benzene-1, 4-dicarboxylic acid

(b) An organic compound with molecular formula $\text{C}_9\text{H}_{10}\text{O}$ forms 2,4-DNP derivative, reduces Tollen's reagent and undergoes Cannizzaro's reaction. On vigorous oxidation it gives 1,2-benzenedicarboxylic acid, Identify the compound.

Q.37. (a) Give chemical tests to distinguish between

- (i) Propanol and propanone
- (ii) Benzaldehyde and acetophenone

(b) Arrange the following compounds in an increasing order of their property as indicated:

- (i) Acetaldehyde, Acetone, Methyl tert-butyl ketone (reactivity towards HCN)
- (ii) Benzoic acid, 3,4-Dinitrobenzoic acid, 4-Methoxybenzoic acid (acid strength)
- (iii) $CH_3CH_2CH(Br)COOH$, $CH_3CH(Br)CH_2COOH$, $(CH_3)_2CHCOOH$ (acid strength)

Q.38. (a) How will you convert the following:

- (i) Propanone to Propan-2-ol
- (ii) Ethanal to 2-hydroxy propanoic acid
- (iii) Toluene to benzoic acid

(b) Give simple chemical test to distinguish between:

- (i) Pentan-2-one and Pentan-3-one
- (ii) Ethanal and Propanal

Q.39. (a) Write the products formed when CH_3CHO reacts with the following reactions:

- (i) HCN
- (ii) $H_2N - OH$
- (iii) CH_3CHO the presence of dilute NaOH

(b) Give simple chemical tests to distinguish between the following pairs of compounds:

- (i) Benzoic acid and Phenol
- (ii) Propanal and Propanone

Q.40. (a) Account for the following:

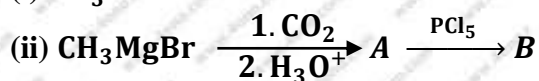
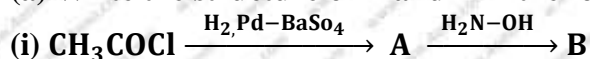
- (i) $Cl - CH_2COOH$ is a stronger acid than CH_3COOH .
- (ii) Carboxylic acids do not give reactions of carbonyl group.

(b) Write the chemical equations to illustrate the following name reactions:

- (i) Rosenmund reduction
- (ii) Cannizzaro's reaction

(c) Out of $CH_3CH_2 - CO - CH_2 - CH_3$ and $CH_3CH_2 - CH_2 - CO - CH_3$ which gives iodoform test?

Q.41. (a) Write the structure of A and B in the following reaction:



(b) Distinguish between:

(i) $\text{C}_6\text{H}_5 - \text{COCH}_3$ and $\text{C}_6\text{H}_5 - \text{CHO}$

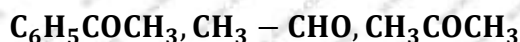
(ii) CH_3COOH and HCOOH

(c) Arrange the following in the increasing order of their boiling points:



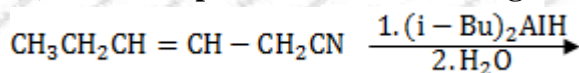
Q.42. (a) Write the chemical reaction involved in Wolf-Kishner reduction.

(b) Arrange the following in the increasing order of their reactivity towards nucleophilic addition reaction:



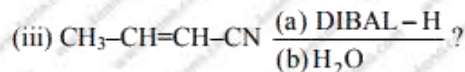
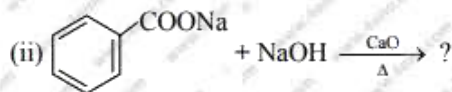
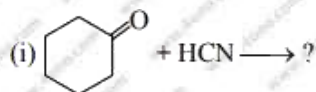
(c) Why carboxylic acid does not give reactions of carbonyl group.

(d) Write the product in the following reaction.



(d) A and B are two functional isomers of compound $\text{C}_6\text{H}_6\text{O}$. On heating with NaOH and I_2 , isomer B forms yellow precipitate of iodoforms whereas isomer A does not form any precipitate. Write the formulae of A and B.

Q.43. (a) Write the product(s) in the following reactions:



(b) Give simple chemical tests to distinguish between the following pairs of compounds:

(i) Butanal and Butan-2-one

(ii) Benzoic acid and Phenol

Q.44. (a) Write the reactions involved in the following:

(i) Etard reaction

(ii) Stephen reduction

(b) How will you convert the following in not more than two steps:

(i) Benzoic acid to Benzaldehyde

(ii) Acetophenone to Benzoic acid

(iii) Ethanoic acid to 2-Hydroxyethanoic acid

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