CHAPTER 17
ALDEHYDES AND KETONES

17.1 NOMENCLATURE OF ALDEHYDES

Common Names

Aldehydes are named after the corresponding acids by replacing the ending *-ic acid* or *-oic acid* with *-aldehyde*.

IUPAC Nomenclature

Suffix	Prefix
-al	*oxo-*

17.2 NOMENCLATURE OF KETONES

Common Names

Ketones are named by adding the ending *-one* to the root name of the parent hydrocarbon.

IUPAC Nomenclature

Ketones are named by adding the ending *-one* to the root name of the longest chain containing the carbonyl group. The position of the carbonyl group is indicated by a number.

17.3 PHYSICAL PROPERTIES OF ALDEHYDES AND KETONES

Boiling Point

Solubility

17.4 PREPARATION OF ALDEHYDES AND KETONES

Oxidation of Primary Alcohols

Oxidation of Secondary Alcohols

Ozonolysis of Alkenes

Friedel-Crafts Acylation

Gilman Reagents

Hydroboration of Alkynes

Hydration of Alkynes

17.5 REACTIONS OF ALDEHYDES AND KETONES

Nucleophilic Addition

Acid-Catalyzed Nucleophilic Addition

Base-Catalyzed Nucleophilic Addition

Reaction with Grignard Reagents

Reaction with Hydride Reagents

Reaction with Primary Amines

Reaction with Secondary Amines

Reaction with Hydrazine

Reaction with Hydroxylamine

Reaction with Alcohols

Reaction with Thiols

Reaction with Ylides

Reaction with Cyanide

Reaction with Bisulfite

Reaction with Alkynes

Reaction with Alkynyl Anions

Reaction with Alkynyl Grignard Reagents

Reaction with Alkynyl Gilman Reagents

Reaction with Alkynyl Hydrides

Reaction with Alkynyl Hydrazines

Reaction with Alkynyl Hydroxylamines

Reaction with Alkynyl Alcohols

Reaction with Alkynyl Thiols

Reaction with Alkynyl Ylides

Reaction with Alkynyl Cyanide

Reaction with Alkynyl Bisulfite

Reaction with Alkynyl Alkynes

Reaction with Alkynyl Alkynyl Anions

Reaction with Alkynyl Alkynyl Grignard Reagents

Reaction with Alkynyl Alkynyl Gilman Reagents

Reaction with Alkynyl Alkynyl Hydrides

Reaction with Alkynyl Alkynyl Hydrazines

Reaction with Alkynyl Alkynyl Hydroxylamines

Reaction with Alkynyl Alkynyl Alcohols

Reaction with Alkynyl Alkynyl Thiols

Reaction with Alkynyl Alkynyl Ylides

Reaction with Alkynyl Alkynyl Cyanide

Reaction with Alkynyl Alkynyl Bisulfite

Reaction with Alkynyl Alkynyl Alkynes

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Reaction with Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Gilman Reagents

Reaction with Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Hydrides

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Reaction with Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Gilman Reagents

Reaction with Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Hydrides

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Reaction with Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alcohols

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Reaction with Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Ylides

Reaction with Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Cyanide

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**Reaction with Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Alkynyl Al

EXERCISE

Q1. Select the right answer from the choices given with each question.

(1) The carbon atom of carbon atom of a carbonyl group is

(1) sp hybridised (2) sp3 hybridised
(3) sp2 hybridised (4) none of these

(2) Ketones are prepared by the oxidation of

(1) primary alcohol (2) secondary alcohol
(3) tertiary alcohol (4) all of these

(3) Acetone reacts with HCN to form a Cyanohydrin. It is an example of

(1) nucleophilic addition (2) electrophilic
addition
(3) nucleophilic substitution (4) nucleophilic substitution

(4) Cannizzaro's reaction is not given by:

(1) Formaldehyde (2) acetaldehyde
(3) benzaldehyde (4) trimethylacetaldehyde

(5) Which of the following reagents will react with both aldehydes and ketones?

(1) Fehling's reagent (2) Tollen's reagent
(3) Fehling's reagent (4) Benedict's reagent

(6) Aldehydes are the oxidation product of

(1) C_2H_5OH (2) $CH_3-CH_2-OCH_3$ (3) CH_3-CH_2-OH (4) $C_2H_5-O-C_2H_5$

(7) Which of the following compounds will not give aldoxime but an hydroxyl oxim

(1) Acetaldehyde (2) Acetone (3) Acrolein (4) C-C
pentanone

(8) Aldehydes and ketones are carbonyl compounds. Which of them react both with hydroxyl and with Tollen's reagent?

(1) butyl aldehyde and butanone (2) formaldehyde only
(3) formaldehyde and tertiary butanone (4) tertiary butanone

(9) Which one of the following can undergo aldol condensation reactions?

(1) Acetaldehyde (2) Acetaldehyde
(3) Formaldehyde (4) Acetaldehyde and formaldehyde

(10) Aldol condensation is not accurate with compounds

(1) having no α-hydrogen (2) having α-hydrogen
(3) having α-β- double group (4) none

(11) Phenylhydrazone on treatment with carbonyl compounds produces

(1) hydrazyl aldoxime (2) phenylhydrazone
(3) oximes (4) none of these

(12) Formaldehyde react with NaOH to give?

(1) tertiary alcohol (2) secondary alcohol
(3) primary alcohol (4) none of these

(13) Cannizzaro's reaction is not given by:

(1) Formaldehyde (2) acetaldehyde
(3) benzaldehyde (4) trimethylacetaldehyde

(14) Which of the following can undergo aldol condensation reactions?

(1) Acetaldehyde (2) Acetaldehyde
(3) Formaldehyde (4) Acetaldehyde and formaldehyde

(15) Which of the following compounds will give aldoxime but not hydroxyl oxim

(1) Acrolein (2) Acetone (3) Acetone (4) C-C
pentanone

(16) Aldehydes and ketones are carbonyl compounds. Which of them react both with hydroxyl and with Tollen's reagent?

(1) butyl aldehyde and butanone (2) formaldehyde only
(3) formaldehyde and tertiary butanone (4) tertiary butanone

(17) Which one of the following can undergo aldol condensation reactions?

(1) Acetaldehyde (2) Acetaldehyde
(3) Formaldehyde (4) Acetaldehyde and formaldehyde

(18) Aldol condensation is not accurate with compounds

(1) having no α-hydrogen (2) having α-hydrogen
(3) having α-β- double group (4) none

(19) Phenylhydrazone on treatment with carbonyl compounds produces

(1) hydrazyl aldoxime (2) phenylhydrazone
(3) oximes (4) none of these

(20) Formaldehyde react with NaOH to give?

(1) tertiary alcohol (2) secondary alcohol
(3) primary alcohol (4) none of these

(21) Cannizzaro's reaction is not given by:

(1) Formaldehyde (2) acetaldehyde
(3) benzaldehyde (4) trimethylacetaldehyde

(22) Which one of the following can undergo aldol condensation reactions?

(1) Acetaldehyde (2) Acetaldehyde
(3) Formaldehyde (4) Acetaldehyde and formaldehyde

(23) Which of the following compounds will give aldoxime but not hydroxyl oxim

(1) Acrolein (2) Acetone (3) Acetone (4) C-C
pentanone

(24) Aldehydes and ketones are carbonyl compounds. Which of them react both with hydroxyl and with Tollen's reagent?

(1) butyl aldehyde and butanone (2) formaldehyde only
(3) formaldehyde and tertiary butanone (4) tertiary butanone

(25) Which one of the following can undergo aldol condensation reactions?

(1) Acetaldehyde (2) Acetaldehyde
(3) Formaldehyde (4) Acetaldehyde and formaldehyde

(26) Aldol condensation is not accurate with compounds

(1) having no α-hydrogen (2) having α-hydrogen
(3) having α-β- double group (4) none

(27) Phenylhydrazone on treatment with carbonyl compounds produces

(1) hydrazyl aldoxime (2) phenylhydrazone
(3) oximes (4) none of these

(28) Formaldehyde react with NaOH to give?

(1) tertiary alcohol (2) secondary alcohol
(3) primary alcohol (4) none of these

(29) Cannizzaro's reaction is not given by:

(1) Formaldehyde (2) acetaldehyde
(3) benzaldehyde (4) trimethylacetaldehyde

(30) Which one of the following can undergo aldol condensation reactions?

(1) Acetaldehyde (2) Acetaldehyde
(3) Formaldehyde (4) Acetaldehyde and formaldehyde

(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)	
(11)		(12)		(13)		(14)		(15)		(16)		(17)		(18)		(19)		(20)	
(21)		(22)		(23)		(24)		(25)		(26)		(27)		(28)		(29)		(30)	

Q2. Give short answers of the following questions.

(a) How is formaldehyde prepared industrially?

Answer

Industrially formaldehyde is prepared by the oxidation of methanol

(b) Describe briefly the nucleophilic addition mechanism to the carbonyl compounds.

Answer

Q3. What is hydrolysis of ACN addition to carbonyl compounds?

Answer

Hydrolysis accounts of 3-2-10 all chapter.

Q4. How is efficient cyanohydrin by hydro, acid?

Answer

Q5. What is hydrolysis of ACN addition to carbonyl compounds?

Answer

Hydrolysis accounts of 3-2-10 all chapter.

Q6. How is efficient cyanohydrin by hydro, acid?

Answer

Q7. What is hydrolysis of ACN addition to carbonyl compounds?

Answer

Hydrolysis accounts of 3-2-10 all chapter.

Q8. How is efficient cyanohydrin by hydro, acid?

Answer

Q9. What is hydrolysis of ACN addition to carbonyl compounds?

Answer

Hydrolysis accounts of 3-2-10 all chapter.

Q10. How is efficient cyanohydrin by hydro, acid?

Answer

Q11. What is hydrolysis of ACN addition to carbonyl compounds?

Answer

Hydrolysis accounts of 3-2-10 all chapter.

Q12. How is efficient cyanohydrin by hydro, acid?

Answer

Q13. What is hydrolysis of ACN addition to carbonyl compounds?

Answer

Hydrolysis accounts of 3-2-10 all chapter.

Q14. How is efficient cyanohydrin by hydro, acid?

Answer

Q15. What is hydrolysis of ACN addition to carbonyl compounds?

Answer

Hydrolysis accounts of 3-2-10 all chapter.

Q16. How is efficient cyanohydrin by hydro, acid?

Answer

Q17. What is hydrolysis of ACN addition to carbonyl compounds?

Answer

Hydrolysis accounts of 3-2-10 all chapter.

Q18. How is efficient cyanohydrin by hydro, acid?

Answer

Q19. What is hydrolysis of ACN addition to carbonyl compounds?

Answer

Hydrolysis accounts of 3-2-10 all chapter.

Q20. How is efficient cyanohydrin by hydro, acid?

Answer

Q21. What is hydrolysis of ACN addition to carbonyl compounds?

Answer

Hydrolysis accounts of 3-2-10 all chapter.

Q22. How is efficient cyanohydrin by hydro, acid?

Answer

Q23. What is hydrolysis of ACN addition to carbonyl compounds?

Answer

Hydrolysis accounts of 3-2-10 all chapter.

Q24. How is efficient cyanohydrin by hydro, acid?

Answer

Q25. What is hydrolysis of ACN addition to carbonyl compounds?

Answer

Hydrolysis accounts of 3-2-10 all chapter.

Q26. How is efficient cyanohydrin by hydro, acid?

Answer

Q27. What is hydrolysis of ACN addition to carbonyl compounds?

Answer

Hydrolysis accounts of 3-2-10 all chapter.

Q28. How is efficient cyanohydrin by hydro, acid?

Answer

Q29. What is hydrolysis of ACN addition to carbonyl compounds?

Answer

Hydrolysis accounts of 3-2-10 all chapter.

Q30. How is efficient cyanohydrin by hydro, acid?

Answer

Q31. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q32. Write structural formula for all compounds of molecular formula C4H8O corresponding to a ketone group.

Answer

Q33. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q34. Give the following reactions of ethylacetate and ketones along with mechanism.

i) Hydro (ii) Catalytic reduction

Answer

i) Reduction of ethylacetate and ketones with NaBH4

Hydrolysis Reaction

Mechanism of Reaction

ii) Reduction of ethylacetate and ketones through catalytic reduction

External Reaction

Q1. What is the mechanism for addition of ammonia derivative to carbonyl group?

Answer

Please c.p.c.ommend of 3-2-10, 3211, 3216, 3217 and 3220 all chapter.

Q2. Which type of aldehydes give Cannizzaro's reaction? Explain with mechanism.

Answer

Please see answer of3-2-10 all chapter notes.

Q3. How do you distinguish α-ketone and an aldehyde by chemical method?

Answer

Aldehydes give the silver mirror test with Tollen's reagent (silver diamine complex) and Fehling's solution (cupric ion) but ketones fail to give any Fehling solution test.

acetone + NH2−NH2 → C3H6N2 + H2O

acetone + NH2−NH−C6H5 → C3H6N−NH−C6H5 + H2O

acetone + C6H5−CHO → C10H12O + H2O

Ketone + C6H5−CHO → C10H12O + H2O

Q4. How will you differentiate between acetophenone and benzophenone?

Answer

Acetophenone and benzophenone can be differentiated through iodoform test. Acetophenone gives a positive test for iodoform while benzophenone does not give iodoform test.

Q5. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q6. Write structural formula for all compounds of molecular formula C4H8O corresponding to a ketone group.

Answer

Q7. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q8. Give the following reactions of ethylacetate and ketones along with mechanism.

i) Hydro (ii) Catalytic reduction

Answer

i) Reduction of ethylacetate and ketones with NaBH4

Hydrolysis Reaction

Mechanism of Reaction

ii) Reduction of ethylacetate and ketones through catalytic reduction

External Reaction

Q9. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q10. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q11. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q12. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q13. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q14. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q15. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q16. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q17. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q18. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q19. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q20. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q21. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q22. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q23. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q24. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q25. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H5

iv) CH3CH2CH2CHO + C2H5−OH

Q26. Predict the formula of the products of the following reactions.

i) CH3CH2CH2CHO + NH2−OH

ii) CH3CH2CH2CHO + NH2−NH2

**iii) CH3CH2CH2CHO + C6H5−NH−NH−C6H

Multiple Choice Questions

1) In aldehyde the c atom of carboxyl group is directly attached to at least:

a) Two hydrogen atom b) Six hydrogen atom
c) One hydrogen atom d) Seven hydrogen atom

2) In Ketones the carbon atom of carboxyl group is bonded to atom _____ called Ketonic group.

a) Six c atom b) Seven c atom
c) Two c atom d) One c atom

3) The homologous series of aldehydes have general formula:

a) CnH2nO b) CH2nO c) CnHO d) CnHnO

4) The homologous series of Ketones have general formula:

a) CnH2O b) CnHO c)CnHnO d) CH2nO

5) Aldehyde group are present in most:

a) Sugar b) Fructose c) Camphor d) Glucose

6) Ketonic group is present in camphor and:

a) Fructose and camphor b) Glucose
c) Sugar d) None

7) The carbon atom of a carboxyl group:

a) sp hybridized b) sp^2 hybridized
c) sp^3 hybridized d) none

8) Water adds on the alkynes in the presence of dil _____and _____ to produce an aldehyde and Ketone.

a) H_2SO_4 and $HgSO_4$ b) NaCl and $HgSO_4$
c) H_2SO_4 and KOH d) None of the above

9) Tone reagents contains:

a) $NaNO_3$ + dil H_2SO_4 + acetone b) $CrCO_3$ + dil H_2SO_4 + acetone
c) $CaCO_3$ + dil H_2SO_4 + acetone d) NaCl + dil H_2SO_4 + acetone

10) In Friedel crafts Acylation of benzene AlC13 generates acylenium ion which is substitutes in the:

a) Aliphatic ring b) Aromatic ring
c) Both a and b d) None of the above

11) The double bond of the carboxyl group has _____ σ _____ and bond.

a) σ bond, σ bond b) σ bond, π bond
c) π and π bond d) None of the above

12) _____is a reaction in which two molecules of same or different carboxyl compound containing hydrogen combine together to form aldol, Ketol:

a) Cannizzaro's reaction b) Aldol condensation
c) Aldehydes d) None of these

13) Aldehydes having no hydrogen atom underdergo:

a) Condensation reaction b) Cannizzaro's reaction
c) Aldol condensation d) Both a and b

14) One acetaldehyde and methyl ketones react with halogens in the presence of sodium hydroxide to give

a) Cannizzaro's reaction b) Aldol condensation
c) Haloform reaction d) None of the above

15) Aldehydes or Ketones react with ammonia derivates G — NH_2 to form compound containing the group C = N —G.

a) Condensation reaction b) Cannizzaro's reaction
c) Haloform reaction d) Both a & b

16) Aldehydes and Ketones with 1-120 to give 1,1 geminal diols known as:

a) Haloform reaction b) Hydrades
c) Nitrogen Nucleophile d) None of the above

17) The Ketones are prepared by oxidation of:

a) Primary alcohol b) Secondary alcohol
c) Tertiary alcohol d) None of those

18) Acetone react with HCN to form a cyanohydrin. It is an example of:

a) Electrophilic addition b) Electrophilic substitution
c) Nucleophilic addition d) Nucleophilic substitution

19) Cannizzaro's reaction is not given by:

a) Formaldehyde b) Acetaldehyde
c) Benzaldehyde d) Trimethylaccaldehyde

20) Which of the following reagents with react with both aldehydes and Ketones?

a) Grignard reagent b) Tollen's reagent
c) Fehing's reagent d) Benedict's reagent

21) Aldehydes are the oxidation of:

a) Prim — alcohols b) Sec — alcholols
c) Ter-alcohols d) Carboxylic acid

22) Which of the following compounds will *not* give Iodoform test a treatment with 12/NaOH?

a) Acetaldehyde b) Acetone
c) Butanone d) None of these

23) Aldehydes and ketones are carboxyl compounds which of them or both react with NaBH4:

a) Both aldehydes and ketones b) Aldehydes only
c) Ketones only d) Neither aldehydes

24) Which one of the following gives aldol reaction?

a) Formaldehyde b) Acetaldehyde
c) Benzaldehyde d) Trimethylaccetaldehyde

25) Aldol condensation is *not* successful with compounds:

a) Hydroxyl amines b) Phenylhydrazone
c) Oximes d) None

26) Formaldehyde react with NH3 to give?

a) Tetra ethylene hexamine b) Tetra ethylene tetramine
c) Hexa methlene tetra amine d) Cyclonite

27) General formula of aldehyde and ketone is:

a) CnH2nO b) CnH2n+1O c) CnHnO d) CnH2n+2O

28) Which of the following can be prepared in the laboratory by dry distillation of (HCOO)2 ca?

a) H2C = CH2 b) HCHO c) CH3OH d) CH3CHO

29) The colour of Iodoform is:

a) White b) Black c) Yellow d) Blue

Answers

1)	c)	2)	c)	3)	a)	4)	a)		
5)	a)	6)	a)	7)	b)	8)	a)		
9)	c)	10)	b)	11)	b)	12)	b)		
13)	b)	14)	c)	15)	a)	16)	b)		
17)	b)	18)	c)	19)	b)	20)	a)		
21)	a)	22)	c)	23)	a)	24)	b)		
25)	d)	26)	c)	27)	c)	28)	b)		
29)	c)								

Short Answer Questions

Q1 What is difference between Aldehydes and Ketones?

Answer

Functional group

Aldehyde contain the carbonyl of ketone group is ketone, the C atom of carbonyl group is bonded to hydrogen atom. Compound in ketone contain two other carbon atoms bonded to carbonyl group.

General formula

Aldehyde contain the general formula R-CHO

Ketone contain the general formula R-CO-R'

Functional formula structure

An aldehyde has one functional formula the general formula structure.

Ketone contain two functional formula structure

Discussion

Aldehyde groups are present in most of carbohydrate and sugars. They are the principal constituents of Cellulose. Ketones are present in Fructose.

Example

Step 1

Step 2

Q2 Write down the structure of following

Answer

a) 2 - methyl - 2 Hexanoar

b) 3 Pentan - 2 - Ketoner

c) 1 - Ethyl cyclo hexanne

d) 3,4 dimethyl cyclo hexanne

Q3 Write down the nomenclature of Ketones?

Answer

An aldehyde is named after the name of carboxylic acid (minimal or its catalytic the ending, -o is replaced by aldehyde.

Reaction type Electrophilic Addition (Nucleophilic) (+ N) (+) ( )

Reaction Nucleophilic Addition of Ketones with Hydrocyanic Acid

Step 1

The electrons in the carbonyl, attracting the carbon of the electrophilic terminal C is electron(+) C is formed by the nucleophile O attracting the other end of the(+) C.

Step 2

The cyanide species combines the monovalent exchange to the carbon.

Step 3

The Protonate deprotonates to give the cyanohydrin compounds.

Q4 Write down the structure of hydrolion of Alcohol?

Answer

Primary alcohol are obtained in the presence of alk. KO_2 and NaO_2 in presence an aldehyde or ketone. Ester hydrolysis in presence alcohol formation into aldehydes or Ketones.

Propyne gives ethine.

The reaction is used for preparing methyl and ethyl ketones.

Q5 Write down the Reaction of oxidation of primary and secondary alcohol?

Answer

Primary alcohols are oxidized to aldehyde(acid) in presence with acidic dichromate. Aldehyde is further oxidized CO_2 or H_2O + acetone (in case of Propan-2-O) in presence of $KMnO_4$.

Vine (aqueous) contains ale converted to ionic further oxidation, secondary alcohol are oxidized to Ketone.

Q6 Write down the Reaction of Hinsb (with) to position of Benzene?

Answer

It is the substitution of ortho group in an organic compound in the presence of electron donor atom.

NO2 substitutes acetanilide ortho position which is substituted in the aromatic ring.

Q7 Write down the Reaction of Hinsb (with) to position of Benzene?

Answer

Aldehyde contain two alkenes in the presence of alk. KO_2 and NaO_2 to produces an alcohol or ketone. End hydrolysis aldehyde which formation into alcoholates or Ketones.

Propyne gives ethine.

The reaction is used for preparing methyl and ethyl ketones.

Q8 Write down the Reaction of oxidation of primary and secondary alcohol?

Answer

1. Addition of hydrogen cyanide

Hydrogen cyanide adds to aldehydes and ketones to form cyanohydrins. The acid-generated ketone form cyanide cyanides (HCN).

2. Addition of Grignard reagent

Organo-lithi. reagent add to aldehydes and ketones to form alcohol which on hydrolysis with a dilute mineral acid gives alcohols.

3. Addition of sodium bisulphite

Mechanism

Q9 Write down the reaction and Mechanism of Cannizzaro's reaction.

Answer

Aldehydes having no hydrogen atoms undergo Cannizzaro's reaction in a disproportionation.

Two molecules of the aldehyde are involved.

One molecule is reduced into corresponding alcohol and the other is oxidized into the acid. The reaction is carried out with 50 percent aqueous solution by hydroxide of each temperature.

Following steps are involved in aldol condensation.

Q10 Write down the reaction and Mechanism of Cannizzaro's reaction.

Answer

Cannizzaro's reaction is a disproportionation reaction.

Two molecules of the aldehyde are involved.

One molecule is reduced into corresponding alcohol and the other is oxidized into the acid. The reaction is carried out with 50 percent aqueous solution by hydroxide of each temperature.

Mechanism

Q11 Write down the Reaction of Aldehyde and Ketone

Answer

The enolate is nucleophile for its carbon molecules of nonaldehyde.

Q12 Write down the steps involved the nucleophilic addition of cyanide to an aldehyde

Answer

Step 1

The nucleophilic C in the cyanide ions is the electrophilic C in the ketone carbonyl group. electron from the C - O mode to the electronegative O creating an intermediate alkoxide.

Step 2

An acid-base reaction Protonation of the alkoxide oxygen creates the cyanohydrin product.

Q13 Write down the condition/ Reaction of ketoform?

Answer

Ketones are oxidized by strong oxidizing agents such as KCr2O7 H2SO4 KMnO4/NaOH and Lucas PRB. The carbon atom joined to the ketoder number of carbon atoms is cleaved and the carbonyl group remains with smaller alkyl group.

Q14 Write down the reaction involved in the condition of ketones

Answer

Ketones are not oxidized by strong oxidizing agents such as KCr2O7 H2SO4 KMnO4/NaOH and Lucas PRB. The carbon atom joined to the smaller number of carbon atoms is cleaved and the carbonyl group remains with larger alkyl group.

In unsymmetrical ketones, the carbon atom joined to the smaller number of carbon atoms is cleaved and the carbonyl group remains with smaller alkyl group.

Q15 Write down the Reaction of aldehydes?

Answer

Aldehyde reacting agents like Tollen's reagent Fehling's solution and Benedict's solution easily oxidized aldehydes to carboxylic acid. They are also oxidized by strong oxidizing agents such as KCr_2O_7, CrO_3, $KMnO_4$ H_2O_2 and dilute nitric acids. The carbon atom joined to the carbonyl group in aldehydes is oxidized to the group in these reactions.

Q16 Write down the steps involved the nucleophilic addition of cyanide to an aldehyde

Answer

Step 1

The nucleophilic C in the cyanide ions is the electrophilic C in the ketone carbonyl group. electron from the C - O mode to the electronegative O creating an intermediate alkoxide.

Step 2

An acid-base reaction Protonation of the alkoxide oxygen creates the cyanohydrin product.

Q17 Write down the condition/ Reaction of aldehydes?

Answer

Aldehyde reacting agents like Tollen's reagent Fehling's solution and Benedict's solution easily oxidized aldehydes to carboxylic acid. They are also oxidized by strong oxidizing agents such as KCr_2O_7, CrO_3, $KMnO_4$ H_2O_2 and dilute nitric acids. The carbon atom joined to the carbonyl group in aldehydes is oxidized to the group in these reactions.

Q18 Write down the steps involved the nucleophilic addition of cyanide to an aldehyde

Answer

Step 1

The nucleophilic C in the cyanide ions is the electrophilic C in the ketone carbonyl group. electron from the C - O mode to the electronegative O creating an intermediate alkoxide.

Step 2

An acid-base reaction Protonation of the alkoxide oxygen creates the cyanohydrin product.

Q19 Write down the condition/ Reaction of aldehydes?

Answer

Aldehyde reacting agents like Tollen's reagent Fehling's solution and Benedict's solution easily oxidized aldehydes to carboxylic acid. They are also oxidized by strong oxidizing agents such as KCr_2O_7, CrO_3, $KMnO_4$ H_2O_2 and dilute nitric acids. The carbon atom joined to the carbonyl group in aldehydes is oxidized to the group in these reactions.

Q20 Write down the reaction involved in the condition of ketones

Answer

Ketones are not oxidized by strong oxidizing agents such as KCr2O7 H2SO4 KMnO4/NaOH and Lucas PRB. The carbon atom joined to the smaller number of carbon atoms is cleaved and the carbonyl group remains with larger alkyl group.

In unsymmetrical ketones, the carbon atom joined to the smaller number of carbon atoms is cleaved and the carbonyl group remains with smaller alkyl group.

Q21 Write down the Reaction of Ketone, Alkane and methane.

Answer

Ketone

Alkane

Methane

Q22 What is halogen cyanides?

Answer

Only acetylacetone and methyl ketone react with halogens (Cl, Br, I) in the presence of alcohol in the solution gives haloform and acetate salt of the acid.