CHEMISTRY

NCERT - NCERT CHEMISTRY(TELUGU)

ORGANIC NITROGEN COMPOUNDS

Self Evaluation A Choose The Correct Answer

1. Bromo ethane reacts with silver nitrite to give

A. $C_2H_5NO_2$

B. $C_2H_5 - O - NO$

C. $C_2H_5Ag + NaBr$

D. C_2H_5NC

Answer:

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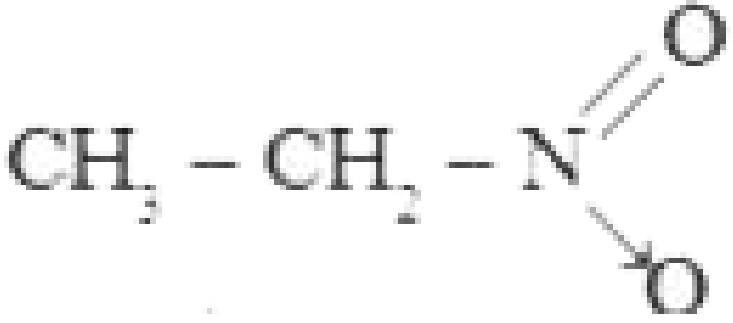
2. The isomerism exhibited by



and

$CH_3CH_2 - O - N = O$ is

A. position

B. chain

C. functional

D. tautomerism

Answer:

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3. In nitro alkanes $-NO_2$ group is converted to $-NH_2$ group by the reaction with

A. Sn/HCl

B. Zn dust

C. Zn / NH_4Cl

D. $Zn / NaOH$

Answer:

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4. When nitromethane is reduced with $\text{Zn dust} \quad + NH_4Cl$ in neutral medium, we get

A. CH_3NH_2

B. $C_2H_5NH_2$

C. CH_3NHOH

D. C_2H_5COOH

Answer:

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5. Among the following compounds the one that is most reactive towards electrophilic nitration is

A. Toluene

B. benzene

C. benzoic acid

D. nitrobenzene

Answer:

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6. Nitromethane condenses with acetaldehyde to give

A. nitro propane

B. 1-nitro-2-propanol

C. 2-nitro-1-propanol

D. 3-nitro propanol

Answer:

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7. Which of the following compounds has the smell of bitter almonds ?

A. aniline

B. nitro methane

C. benzene sulphonic acid

D. nitrobenzene

Answer:

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8. Nitration of nitrobenzene results in

A. o-dinitro benzene

B. 1,3,5-trinitro benzene

C. p-dinitro benzene

D. m-dinitro benzene

Answer:

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9. Nitrobenzene on electrolytic reduction in con. sulphuric acid, the intermediate formed is

A. $C_6H_6NH - NHC_6H_5$

B. $C_6H_5 - NHOH$

C. $C_6H_5 - N = N - C_6H_5$

D. $C_6H_5 . HSO_4$

Answer:

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10. Electrophile used in the nitration of benzene is

A. hydronium ion

B. sulphonic acid

C. nitronium ion

D. bromide ion

Answer:

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11. The reduction of $CH_3 - CH_2 - C \equiv N$ with sodium and alcohol results in the formation of

A. $CH_3 - \underset{\underset{NH_3}{|}}{CH} - CH_3$

B. $CH_3 - CH_2 - CH_2 - OH + N_2$

C. $CH_3 - CH_2 - CH_2 - NH_2$

D. $CH_3 - CH_2 - NH_2$.

Answer:

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12. The basic character of amines is due to the

A. tetrahedral structure

B. presence of nitrogen atom

C. lone pair of electrons on nitrogen atom

D. high electronegativity of nitrogen

Answer:

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13. The organic compound that undergoes carbylamine reaction is

A. $(C_2H_5)_2NH$

B. $C_2H_5NH_2$

C. $(C_2H_5)_3N$

D. $(C_2H_5)_4N^+I^-$

Answer:

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14. Primary amine acts as

A. Electrophile

B. Lewis base

C. Lewis acid

D. Free radical

Answer:

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15. Oxidation of aniline with acidified potassium dichromate gives

A. p-benzo quinone

B. benzoic acid

C. benzaldehyde

D. benzyl alcohol

Answer:

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16. Which one of the following is a secondary amine ?

A. aniline

B. diphenyl amine

C. sec.butylamine

D. tert.butylamine

Answer:

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17. $C_6H_5NH_2 \xrightarrow{NaNO_2 / HCl} X$. Identify X.

A. C_6H_5Cl

B. C_6H_5NHOH

C. $C_6H_5N_2Cl$

D. C_6H_5OH

Answer:

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18. Which of the following will not undergo diazotisation ?

A. m-toluidine

B. aniline

C. p-amino phenol

D. benzyl amine

Answer:

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19. Aniline differs from ethylamine by the reaction with

A. metallic sodium

B. an alkyl halide

C. chloroform and caustic potash

D. nitrous acid

Answer:

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20. When aqueous solution of benzene diazonium chloride is boiled the product formed is

A. benzyl alcohol

B. $\text{benzene} \quad + N_2$

C. phenol

D. phenyl hydroxylamine

Answer:

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Self Evaluation B Answer In One Or Two Sentence

1. How is nitrobenzene prepared?

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2. Write about the functional isomerism of nitro methane ?

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3. Give the reduction of nitromethane in (a) acid medium, (b) neutral medium.

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4. Mention the uses of nitromethane.

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5. How will you convert benzene to m-dinitro benzene ?

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6. Explain the electrolytic reduction of nitro benzene ?

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7. What are amines ? How are they classified ?

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8. Give the structural formula of (i) 2-amino-2-methyl propane. (ii) 2-(N, N-dimethyl) amino butane

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9. What happens when acetonitrile is hydrolysed ?

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10. Write the name and structure of four isomeric amines having the molecular formula C_3H_9N.

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11. How will you distinguish between ethylamine and diethylamine ?

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12. Write a note on the basicity of amines ?

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13. Explain why ethylamine is stronger than ammonia ?

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14. What is Gabriel phthalimide synthesis ?

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15. How is nitrobenzene converted to aniline ?

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16. What happens when aniline is treated with bromine ?

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17. What happens when aniline is treated with phosgene ?

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18. How will you distinguish between aniline and ethylamine ?

Watch Video Solution

19. Explain why aniline is less basic than methylamine ?

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20. How is benzene diazonium chloride prepared ? Give equation.

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21. Write a note on Sandmeyer's reaction.

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22. How will you synthesise, benzylamine from aniline ?

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23. What are the reagents that would convert the following into Ethyl amines ?

(a) CH_3CONH_2 (b) CH_3CN (c) $CH_3CH_2NO_2$

(d) $CH_3CH = NOH$

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24. Account for the following :

(a) $(CH_3)_2NH$ is a stronger base than NH_3

(b) $CH_3CH_2NH_2$ is more basic than CH_3CONH_2

(c) Aniline is less basic than Ethyl amine

(d) On sulphonation of aniline, p-amino benzene sulphonic acid is formed.

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25. What is the action of $NaNO_2 / HCl(aq)$ at ice cold temperature on

(a) $C_2H_5NH_2$ (b) $C_6H_5NH_2$ (c) $(CH_3)_2NH$ (d) $(CH_3)_3N$

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26. What happens when ethylamine is treated with

(a) $CHCl_3/NaOH$ (b) CS_2 (c) $COCl_2$ (d) C_6H_5CHO

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27. What is the action of

(a) Diethyl oxalate on Ethylamine

(b) Diethyl oxalate on Diethyl amine

(c) Nitrous acid on Diethyl amine

(d) Nitrous acid on Triethyl amine

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28. What happens when

(a) nitro ethane is boiled with HCl

(b) nitro benzene is treated with Lithium Aluminium Hydride

(c) When Toluene is treated with fuming nitric acid and sulphuric acid.

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29. Account for

(a) Nitration of benzene is easier than nitration of nitrobenzene

(b) Benzaldehyde undergoes condensation with nitro methane in presence of KOH

(c) Nitromethane gives trichloro nitro methane on treatment with chlorine/NaOH while nitro ethane gives only dichloro ethane

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30. How can the following conversions be effected ?

(a) Nitro benzene $\rightarrow$ Nitrosobenzene

(b) Nitro benzene $\rightarrow$ azoxy benzene

(c) Nitrobenzene $\rightarrow$ Hydrazobenzene

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31. Distinguish between

(a) Nitroethane and ethyl nitrite

(b) Nitro benzene and nitro phenol

(c) Nitro toluene and phenyl, nitromethane

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Self Evaluation C Answer Not Exceeding Sixty Words

1. Write the methods of preparation of nitro methane ?

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2. Explain the reduction of nitro methane in different medium.

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3. Write a note on the ‘reduction of nitro benzene under different conditions.

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4. Explain the mechanism of nitration of nitro benzene.

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5. Write the differences between nitro methane and nitro benzene.

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6. Give three methods of preparing ethylamine from aceto nitrile ?

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7. Distinguish between primary, secondary and tertiary amines.

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8. Write the mechanism of Hoffmann bromamide reaction.

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9. How do primary, secondary and tertiary amines react with nitrous acid ?

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10. Write any three methods of preparing benzylamine ?

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11. Comment on the 'basic nature' of aniline.

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12. Write a note on

(i) Carbylamine reaction, (ii) Mustard oil reaction, (iii) Acetylation of benzylamine, (iv) Formation of Schiff's base, (v) Diazotisation reaction.

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13. Distinguish between benzylamine and aniline.

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14. How are the following compounds obtained from benzene diazonium chloride ?

(i) phenol, (ii) ester, (iii) p-hydroxy azo benzene.

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Self Evaluation D Solve The Problems

1. Nitrobenzene does not undergo Friedel-Crafts alkylation. Give reasons.

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2. Boiling points of nitroalkanes are much higher than those of hydrocarbons of comparable mass - give reasons.

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3. Explain why amines are more basic than amides.

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4. An organic compound (A) with molecular formula C_6H_7N gives (B) with HNO_2 / HCl at 273

K. The aqueous solution of (B) on heating gives compound (C) which gives violet colour with neutral $FeCl_3$. Identify the compounds A, B and C and write the equations.

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5. Outline the mechanism of

(a) Nitration of aniline

(b) Acetylation of aniline to form acetanilide

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6. Outline the preparation of

(a) para nitroaniline from aniline

(b) tri bromo benzene from tribromo aniline

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7. Indicate the mechanism of

(a) the formation of N-methyl aniline from aniline

(b) the formation of p–hydroxy azobenene from benzene diazonium chloride

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8. Explain the following order of strength of bases.

(a) $(CH_3)_2NH > CH_3NH_2 > NH_3$

(b) p-toluidine > Aniline > p-nitro aniline

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Diazonium Chloride

1. How are the following conversions effected ?

(a) $C_6H_5NH_2 \rightarrow C_6H_6$

(b) $C_6H_5NO_2 \rightarrow C_6H_5OH$

(c) $C_6H_5NH_2 \rightarrow C_6H_5I$

(d) $C_6H_5NH_2 \rightarrow C_6H_5NO_2$

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2. Starting from aniline how can the following be prepared ?

(a) Chloro benzene

(b) p-hydroxy azobenzene

(c) Benzonitrile

(d) (d) p-amino azo benzene

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3. How can the following conversion be effected ?

(a) Nitrobenzene to anisole

(b) Chloro benzene to phenyl hydrazine

(c) Aniline to benzoic acid

(d) Benzene diazonium chloride to Ethyl benzene

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4. Identify the electrophile and nucleophile in the following reactions :

(a) $C_6H_5N_2Cl + KI \rightarrow C_6H_5I + KCL$

(b)

$C_6H_5N_2Cl + C_6H_5OH \rightarrow C_6H_5N = N - C_6H_4OH$

(c) $C_6H_5N_2Cl + CH_3OH \rightarrow C_6H_5OCH_3$

(d) $C_6H_5N_2Cl + H_2O \rightarrow C_6H_5OH$

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