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QB365 Question Bank Software Study Materials

Organic Nitrogen Compounds Important 2 Marks Questions With Answers (Book Back and Creative)

12th Standard

Chemistry

Total Marks: 40

2 Marks

 $20 \times 2 = 40$

Write down the possible isomers of the C₄H₉NO₂ give their IUPAC names.

Answer:

Isomerism	Structural formula of isomers
Chain isomerism:	
They differ in the	CH ₃ CH ₂ CH ₂ CH ₂ - NO ₂ and CH ₃ CHCH ₂ - NO ₂
length of carbon	1 - nitrobutane 2 - methyl - 1-nitropropane
chain.	
Position	
isomerism:	
They differ in the	NO ₂ CH ₃ CH ₂ CH ₂ CH ₂ -NO ₃ CH ₃ CHCH ₂ CH ₃ and CH ₃ -C NO ₃ CH ₃ CHCH ₂ CH ₃ and CH ₃ -C NO ₃ CH ₃ CH ₃ CH ₃ 1 - nitrobutane 2 - nitrobutane 2 - methyl - 2 - nitrop ropane
position of nitro	
group.	
Functional	
isomerism:	
Nitroalkanes exhibit	$ ext{CH}_3 ext{CH}_2 ext{CH}_2 ext{CH}_2 - ext{NO}_2 ext{ and } ext{CH}_3 ext{CH}_2 ext{CH}_2 ext{CH}_2 - ext{O} - ext{N} = ext{O} \ 1-nitrobutane \qquad \qquad butyl \ nitrite$
functional	
isomerism	
with alkylnitrites	

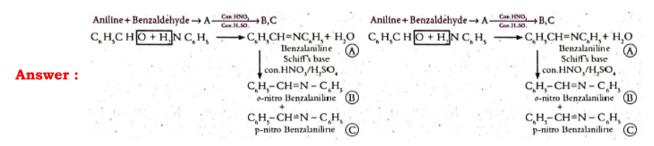
2) What is 'spirit of nitre'? Give its use.

Answer: 4% solution of ethylnitrite in alcohol is known as sweet spirit of nitre and in used as diuretic.

3) Complete the following reaction

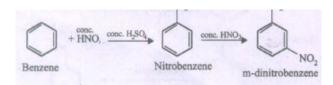
$$\begin{array}{c} CH_2\text{-}NH_2 \\ \hline \\ CH_2-NH_2 \\ \hline \\ CH_2-NH_2 \\ \hline \\ CH_2-NH_2 \\ \hline \\ CH_2-NH_2 \\ \hline \\ Cyclohexanone \\ \hline \\ Benzyl amine \\ \hline \\ \\ Benzyl amine \\ \hline \end{array}$$

4) Identify A aniline + benzaldehyde \rightarrow A



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

Answer: Benzene on reaction with a mixture of cone. HNO₃ and cone. H₂SO₄ produces nitro benzene as product which on further nitration will result in the formation of m-dinitrobenzene.



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

Answer: (i) 2-amino-2-methyl propane

$$CH_3-\stackrel{CH_3}{\overset{|}{C}}-CH_3$$

$$\stackrel{|}{NH_2}$$

(ii) 2-(N, N- dimethyl) amino butane

$$CH_3$$
 CH_3

$$CH_3-CH_2-C\overset{ert}{H}-\overset{ert}{N}-CH_3$$

7) Write the name and structure of four isomeric amines having the molecular formula C₃H₉N

Answer: (i) CH₃ - CH₂ - CH₂NH₂ 1-amino propane

(ii)
$$CH_3-CH-CH_3\,$$
 2-amino propane

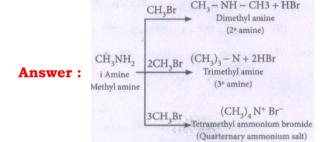
$$\stackrel{|}{NH_2}$$

(iii)
$$CH_3 - CH_2 - N - CH_3$$
 N - Methyl amino ethane CH_2

$$CH_2$$

(iv)
$$CH_3-\stackrel{ert}{N}-CH_3$$
 N,N-Dimethyl methanamine

8) Convert methyl amine (1° primary amine) to 2°, 3° amine and Quarternary ammonium salt.



Complete the following reaction.

$$N_2$$
-Cl $\xrightarrow{SnCl_2 + HCl}$?

10) Identify A and B.

$$CH_3CN \xrightarrow[Partial\ hydrolysis]{H_2O/OH^-} A \xrightarrow[Complete\ hydrolysis]{2H_2O/H^+} E$$

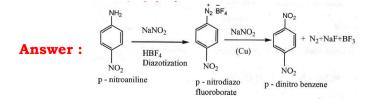
Answer: On boiling with alkali (or) a dilute mineral acid the cyanides are hydrolysed to give carboxylic acids.

$$CH_3 - CN + H_2O \xrightarrow{H_2O/OH^-} CH_3 - \overset{O}{\underset{Ethanenitrile}{U}{Complete\ hydrolysis}} CH_3 - \overset{O}{\underset{H_2O/OH^-}{C}{Complete\ hydrolysis}} CH_3 - \overset{O}{\underset{H_2O/OH^-}{C}{Complete\ hydrolysis}} CH_3 - \overset{O}{\underset{Acetic\ acid}{C}{Complete\ hydrolysis}} CH_3 - \overset{O}{\underset{Acetic\ acid}{C}{Complete\ hydrolysis}} CH_3 - \overset{O}{\underset{H_2O/OH^-}{C}{Complete\ hydrolysis}} CH_3 - \overset{O}{\underset{H$$

11) Give any two uses of nitrobenzene.

Answer: (i) Nitrobenz-ene is used to produce lubricating oils in motors and machinery.

- (ii) It is used in the manufacture of dyes, drugs, pesticides, synthelic rubber, aniline and explosives like TNT, TNB.
- 12) How will you prepare p - dinitrobenzene?



- How are the following conversions effected?
 - a) Methyl bromide \rightarrow Methylamine
 - b) Chloro benzene → Aniline
 - c) Phenol → Aniline

$$\begin{array}{c} \textbf{Answer: a)} & CH_3Br \\ & & Methylbromide\ Methyl\ azide \\ \textbf{b)} & C_6H_5Cl \xrightarrow{Alc.NH_3 \atop Cu_2O/200^0C} \\ C_6H_5NH_2 \\ & Chlorobenzene & Aniline \\ \textbf{c)} & C_6H_5OH \xrightarrow{NH_3 \atop Anhy.ZnCl_2300^0C} \\ C_6H_5NH_2 \\ & Phenol & Aniline \\ \end{array}$$

Nitrobenzene is soluble in NaOH. Why?

Write a note on alkylation of amines.

Answer: 1° amines reacts with alkyl halides to give successively 2° and 3° amines and quaternary ammonium salts

$$R-NH_{2} \xrightarrow{CH_{3}Br} R-NH-CH_{3}+HBr$$

$$2^{0} - amine$$

$$R-NH_{2} \xrightarrow{2^{0} - amine} R^{-} N (CH_{3})_{2} + 2HBr$$

$$3^{0} - amine$$

$$R-NH_{2} \xrightarrow{3^{0} - amine} R^{-} N (CH_{3})_{3} Br^{-}$$

$$R-NH_{3} \xrightarrow{3^{0} - amine} R^{-} N (CH_{3})_{3} Br^{-}$$

- How will you prepare ethyl isocyanide from the following:
 - a) Ethyl bromide
 - b) N ethyl formamide

Answer: a) From ethyl bromide:

$$\begin{array}{ccc} CH_{3}CH_{2}Br + AgCN & \xrightarrow{C_{2}H_{5}OH} & CH_{3}CH_{2}NC + AgBr \\ \text{Ethyl bromide} & \text{Ethyl isocyanide (Major)} \end{array}$$

b) From N - alkyl formamide:

$$CH_3 - NH - C - H \xrightarrow{POCl_3} CH_3 - N \Longrightarrow C + H_2O$$

- What happens when the following are reduced with $\mathrm{Na/C_2H_5OH}(or)\mathrm{Ni/H_2}$
 - a) CH₃NC
 - b) $\mathrm{CH_3CH_2NC}$

What happens when

iii. Oxidation of text - butylamine with KMnO₄

Answer: iii) Oxidation of text – butylamine with KMnO₄:

$$\begin{array}{c} \text{CH}_{3} & \text{CH}_{3} \\ \text{CH}_{3} - \text{C} - \text{NH}_{2} \xrightarrow{\text{KMnO}_{4}} \text{CH}_{3} - \text{C} - \text{NO}_{2} + \text{H}_{2}\text{O} \\ \text{CH}_{3} & \text{CH}_{3} \\ \text{t- butylamine} & 2\text{- methyl} - 2\text{- nitro propane} \end{array}$$

It gives 2 - methyl - 2- nitro propane is obtained.

What happens when

iv. Oxidation of acetoneoxime with trifluor operoxy acetic acid. **Answer:** iv) Oxidation of acetoneoxime with trifluoroperoxy acetic acid.

$$CH_3 - C = N - OH \xrightarrow{CF_3COOH} CH_3 - CH - NO_2$$

$$CH_3$$
Acetone oxime (2-nitro propane)

It gives 2 - nitro propane.

How will you convert nitrobenzene into

vi. N – phenylhydroxylamine

Answer: Nitrobenzene into N - phenyl hydrazobenzene

