



### **CHEMISTRY**

### **BOOKS - MODERN PUBLICATION**

## ORGANIC COMPOUNDS CONTAINING NITROGEN



1. Primary amine is given by

- A. (a) reduction of amides
- B. (b) reduction of nitroalkanes
- C. (c) reduction of alkyl cyanides
- D. (d) reduction of isonitriles

Answer: D



 Primary and secondary amines are distinguished byA. (a) Br (2)

B. (b)  $NH_3$ 

D. (d) 
$$CHC\frac{l_3}{K}OH$$

#### Answer: D



3. Primary Amine on reduction gives by

A. (a) 
$$CH_3-CH_2$$

B. (b)  $CH_3 - CO$ 

C. (c)  $CH_3-CH_2-NO_2$ 

D. (d) none of these

Answer: C

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4. When methyl amine is treated with Na

metal, \_\_\_\_\_ is formed.

A. (a)  $CH_4$ 

B. (b)  $CH_3 - NO_2$ 

C. (c)  $CH_3 - OH$ 

D. (d)  $H_2$ 

Answer: D

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5. The number of isomeric amines given by  $C_4 H_{11} N$ 

A. (a) 2

B. (b) 4

C. (c) 6

D. (d) 7

Answer: B

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6. Nitroethane on heating with Sn and HCl

produce—

A. (a) ethyl amine

B. (b) Methyl amine

C. (c) ethyl cyanide

D. (d) none of these

Answer: A

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7.  $1^{\circ}$  ,  $2^{\circ}$  and  $3^{\circ}$  -amines can be distinguished

from each other by—

A. (a) carbyl amine reaction

B. (b) action with nitrous acid

C. (c) both (a) and (b)

D. (d) none of these

Answer: B

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8. Lower amines are soluble in water due to—

A. (a) low molecular mass

B. (b) dipole-dipole interaction

C. (c) hydrogen bonding

D. (d) covalent bonding

Answer: C

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**9.** Which amine gives an alcohol with nitrous acid ?

A. (a)  $C_2H_5-NH_2$ 

B. (b)  $(C_2 H_5)_2 N H$ 

### C. (C) $(C_2H_5)_3N$

D. (d) none of these

### Answer: A



### 10. Which one can respond carbyl amine test?

A. (a)  $C_2H_5-NH_2$ 

B. (b)  $(CH_3)NH$ 

C. (c)  $(C_6H_5)N$ 

D. (d) none of these

Answer: A

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**11.** The reactive species during nitration of benzene is :

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**12.** Chloropicrin is obtained by the reaction of :

A. (a) steam on  $\mathbb{C}l_4$ 

B. (b) nitric acid on chlorobenzene

C. (c) chlorine on picric acid

D. (d) nitric acid on chloroform

Answer: D

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13. Write the reaction between  $NH_3$  and

 $XeF_6$ 



**14.** Which of the following gives primary amine on reduction?

A. (a)  $CH_3CH_2NO_2$ 

B. (b)  $CH_3CH_2O - N = O$ 

C. (c)  $C_6H_5N=NC_6H_5$ 

D. (d)  $CH_3CH_2NC$ 

### Answer: A

**15.** The electrolytic reduction of nitrobenzene is strongly acidic medium gives

A. (a) Phenol

B. (b) P-Aminophenol

C. (c) Hydrazobenzene

D. (d) Azobenzene

Answer: B

16. The reaction of primary amine with an aldehyde gives a/an Watch Video Solution **17.** Acetaldehyde is used as and Watch Video Solution **18.** Acetanalide on nitration followed by

alkaline hydrolysis gives

- A. (a) o-nitro acetanilide
- B. (b) p-nitro aniline
- C. (c) m-nitro aniline
- D. (d) 2,4,6 trinitroaniline

Answer: B

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19. Nitration is easy in case of :

A. (a) toluene

B. (b) nitrobenzene

C. (c) chlorobenzene

D. (d) sulpho benzene

Answer: A

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**20.** Diazotisation can be carried out by the action of  $NaNO_2$  and HCl on the cold

A. (a) aromatic secondary amine

B. (b) aromatic primary amine

C. (c) aromatic nitro amine

D. (d) acid amide

Answer: B

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21. Among the following weakest base is :

A. (a)  $C_6H_6CH_2NH_2$ 

B. (b)  $C_6H_6CH_2NHCH_3$ 

### C. (c) $O_2N-CH_2NH_2$

### D. (d) $CH_3NHCHO$

Answer: C

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22. Which of the following is basic?

A. (a)  $CH_3CH_2OH$ 

B. (b)  $CH_3COOH$ 

C. (c)  $CH_3NH_2$ 

D. (d)  $CH_3OCH_3$ 

### Answer: C

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23. Carbyl amine reaction is given by

A. (a)  $-NH_2$  group

B. (b) -NH group

C. (c)  $-NO_2$  group

D. (d) -N group





**24.** Which of the following will not liberate nitrogen by reaction with nitrous acid ?

A. (a)  $CH_3NH_2$ 

B. (b)  $CH_3CH_2NH_2$ 

C. (c)  $(CH_3)_2 NH$ 

D. (d)  $(CH_3)_3C - NH_2$ 





# **25.** When methyl amine is treated with $HNO_2$ product obtained is

A. (a)  $CH_4$ 

B. (b)  $CH_3OH$ 

C. (c)  $CH_3NO_2$ 

D. (d)  $NH_3$ 





## **26.** Which of the following has highest boiling point ?

A. (a)  $CH_3NH_2$ 

B. (b)  $CH_3CH_3$ 

C. (c)  $CH_3OH$ 

D. (d) HCOOH





**27.**  $C_3H_9N$  cannot represent :

A. (a) 1º amine

B. (b) 2º amine

C. (c) 3° amine

D. (d) quaternary salt

Answer: D



### 28. Reaction of ethylamine with chloroform in

alcoholic KOH gives :

A. (a)  $C_2 H_5 CH$ 

B. (b)  $C_2H_5NC$ 

C. (c)  $CH_3CN$ 

D. (d)  $CH_3NC$ 

### Answer: B





**29.** Out of the following compounds, which is

the most basic ?

A. (a)  $CH_3NH_2$ 

B. (b)  $(CH_3)_2 NH$ 

C. (c)  $(CH_3)_3N$ 

D. (d)  $C_6H_5NH_2$ 

### Answer: B

**30.** An isocyanide on reduction with hydrogrn in the presence of Pt gives :

A. (a) amide

B. (b) primary amine

C. (c) secondary amine

D. (d) alcohol

Answer: C

31. Nucleophilic substitution reaction is easier

in :

A. (a) nitro benzene

B. (b) aniline

C. (c) phenol

D. (d) benzene

Answer: A

32. Secondary nitro alkanes react with nitrous

acid to give :

A. (a) pseudo nitrols

B. (b) nitrolic acid

C. (c) alcohols

D. (d) carboxylic acids

Answer: A

33. Nitromethane reacts with benzaldehyde in

presence of alc. KOH to form:

A. (a) nitro benzene

B. (b) aniline

C. (c) nitro styrene

D. (d) p-nitro toluene

### Answer: C



### 36. When methyl iodide reacts with potassium

nitrite, the major product obtained is :

A. (a) methylnitrite

B. (b) methylcyanide

C. (c) methylnitrile

D. (d) nitromethane

Answer: A

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### **37.** 2-Nitropropane with boiling HCl gives :

A. (a) propanamine

B. (b) propanamide

### C. (c) propanone

D. (d) propanoic acid

### Answer: C



### 38. The reaction of nitrite ion with alkyl halide

is a

A. (a) nucleophilic substitution reaction

B. (b) electrophillic substitution reaction

C. (c) free radical substitution reaction

D. (d) none of the above

Answer: A

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**39.** 1° Nitroalkane with boiling HCl gives

A. (a) alkanamide

B. (b) alkanoic acid

C. (c) alkanamide

D. (d) alkanone

Answer: B

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**40.** Reduction of nitroalkane in neutral medium is made with

A. (a)  $H_2/Ni$ 

B. (b)  $LiAlH_4$ 

C. (c)  $Zn/NH_4Cl$ 

D. (d)  $NaBH_4$ 

### Answer: C

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## **41.** The reaction of acetamide with bromine and caustic potash or NaOBr gives :

A. (a)  $CH_3COOH$ 

B. (b)  $CH_3CH_2NH_2$ 

C. (c)  $CH_3COONH_4$
D. (d) CH\_(3)NH\_(2)

#### Answer: D

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#### 42. Ethylamine reacts with nitrous acid to form

A. (a)  $C_2 H_5 OH$ 

B. (b)  $C_2H_5OH, N_2, H_2O$ 

C. (c)  $C_2 H_5 N_2^{\,+} C l^{\,-}$ 

D. (d)  $C_2H_5NHOH, NH_3$ 

#### Answer: B



43. Which of the following intermediate does not exist during Hofmann degradation of  $R - CONH_2$  with  $Br_2$  and NaOH?

A. (a) R-N=C=O

B. (b) R-CO-NHBr

C. (c) R-CO-N-Br

d) 
$$R - C = N - Br$$
  
l  
D. (d) O

Answer: C



**44.** The compound  $C_5H_{13}N$  is optically active and reacts with *HONO* to give  $C_5H_{11}OH$ . The compound is

A. (a) N- Methylbutanamine

B. (b) 2- Aminopentane

## C. (c) 1- Aminopentane

D. (d) N, N' - Dimethyl propanamine

Answer: B

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**45.** The compound which on reaction with nitrous acid at low temperature produces an oily compound is :

A. (a) Diethylamine

B. (b) Ethylamine

C. (c) Methylamine

D. (d) Propylamine

Answer: A

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**46.** Which of the following amines gives carbylamine reaction ?

A. (a)  $C_2H_5NH_2$ 

B. (b)  $(C_2 N_5)_2 N H$ 

C. (c)  $(C_2H_5)_3N$ 

D. (d)  $CH_3NHC_2H_5$ 

Answer: A

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47. Hinsberg's reagent is used to identify :

A. (a) alcohols

B. (b) ketons

## C. (c) amines

D. (d) nitroalkanes

#### Answer: C



48. Which of the following amines cannot be

acylated using acetyl chloride ?

A. (a) methylamine

B. (b) Dimethylamine

C. (c) Trimethylamine

D. (d) Ethylamine

#### Answer: C

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**49.** Diethylamine reacts with nitrous acid to give

A. (a)  $(C_2 H_5)_2 NH^+ NO_2^-$ 

B. (b)  $(C_2H_5)_2\mathbb{N}O$ 

## C. (c) $C_2H_5OH$

D. (d)  $N_2$  and alcohol

Answer: B

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50. Silver chloride is soluble in methylamine

due to the formation of

A. (a)  $Ag(CH_3NH_2)Cl$ 

B. (b)  $Ag+CH_3Cl+NH_4Cl$ 

## C. (c) $\left(Ag(CH_3NH_2)_2Cl\right)$

D. (d) AgOH

#### Answer: C

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51. Nitrous acid has no action on :

A. (a)  $CH_3CH_2NO_2$ 

B. (b)  $CH_3CH_2COOH$ 

C. (c)  $C_6H_5N(CH_3)_2$ 

## D. (d) $C_6H_5CONH_2$

Answer: B

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**52.** Secondary nitro alkanes react with nitrous acid to give :

A. (a) nitrolic acid

B. (b) nitric acid

C. (c) pseudonitrile

D. (d) does not exist

Answer: A

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**53.** What happens when nitromethane reacts with chlorine in presence of NaOH ?

A. (a) chloroform

B. (b) chloramine

C. (c) chloromethane

D. (d) chloropicrin

#### Answer: D

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# 54. The colour of the product obtained by reacting 2° nitroalkane with $HNO_2$ is :

A. (a) white

B. (b) blue

C. (c) red

D. (d) yellow

Answer: B

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**55.** Nitrolic acid obtained from 1° - Nitroalkane and  $HNO_2$  reacts with NaOH to form solution of colour

A. (a) red

B. (b) blue

C. (c) yellow

D. (d) white

#### Answer: A



56. Hinsberg's reagent is :

A. (a) benzene sulphonyl chloride

B. (b) benzene sulphonic acid

C. (c) phenyl isocyanide

D. (d) benzene suplhonamide

Answer: A

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**57.** The number of possible structures of amines  $(C_7H_9N)$  having one benzene ring is :

A. (a) 5

B. (b) 3

C. (c) 4

D. (d) 6

Answer: A

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**58.** ρ - chloroaniline and anilinium hydrochloride can be distinguished by :

A. (a) Sandmeyer's reaction

B. (b)  $NaHCO_3$ 

C. (c)  $AgNO_3$ 

D. (d) Carbylamine test

#### Answer: D

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**59.** Primary and secondary amines can be distinguished by :

A. (a) Schiff's reagent

B. (b) carbylamine reaction

C. (c) Hofmann bromide reaction

D. (d) Biuret reaction

Answer: B

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**60.** Which of the following methods is neither meant for synthesis nor for the separation of amines ?

A. (a) Wurtz reaction

B. (b) Curtius reaction

C. (c) Hinsberg's method

D. (d) Hofmann method

Answer: A

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61. What is the general formula of aliphatic

amine?







## **66.** Amines are \_\_\_\_ in nature.





**69.**  $CH_3NH_2$  is \_\_\_\_.



## 70. Ethyl cyanide on reduction with

## $Na \, / \, C_2 H_5 OH$ gives ethyl amine.



## **71.** \_\_\_\_ gives carbyl amine test.



74. Primary amine is produced, when an amide

is treated with \_\_\_.

75. When 1° amine is treated with nitrous acid

\_\_\_\_ is produced.



**76.** \_\_\_\_ is formed when primary amine is heated with methyl magnesium bromide.



77. Quaternary ammonium salt is used in production of . Watch Video Solution 78. write chemical formulae of potassium hexacyano cobaltate(III) ion? Watch Video Solution





**84.** Write the IUPAC and Trivial names of the following:

## (I) $CH_3NC$ (II) $CH_3CN$ (III) $CH_3NHC_2H_5$



**85.** Write the IUPAC name of the following compounds.(I) Ethylcyanide (II) Methylcyanide (III) Isopropylamine (IV) Ethylamine (V) Dimethylamine



**86.** Why amines are basic in nature ?



89. Lower amines are soluble in water due to-



90. Write brief note on Hoffmann's bromamide

reaction :



91. What is vapour phase nitration?





**92.** Write the main use of quarternary ammonium salt.

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**93.** Give the order of basic nature of three amines.



96. How can you get nitrohexane from hexane?

**97.** Write the IUPAC name of trimethyl amine.



primary amines from



(ii) alkyl cynide


**102.** Distinguish between primary and secondary amines. Give one test only with equation.

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# 103. The M.P. is highest for primary amides,

why?

**104.** Why nitroalkanes are used as explosives ?



**105.** What are amines? Explain three types of aliphatic amines giving one example from each. Write with equations how amines react with

acid chloride?

**106.** How can you distinguish between primary, secondary and tertiary alcohols? With equation explain how does ethyl alcohol react with (i) acidified  $K_2Cr_{20} - 7$ , solution and(ii) phosphorous pentachloride?

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107. Compare the basic characters of methyl

amine and bimethyl amine.

108. What happens when nitroethane reacts

with NaOH?

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**109.** Compound formed, when ethyl amine is heated with chloroform is the presence of KOH

is :

**110.** Convert Aniline to Chlorobenzene.



**112.** How will you convert aniline to benzoic

acid?



degration of m-bromobenzamide?

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**114.** Arrange the following

In the decreasing order of basic strength in

gas

phase





116. What is Gattermann's reaction?

**117.** How does ethylamine react with benzene sulphonyl chloride ? Name the reaction.



# 118. How is phenylaminomethane obtained

from phenylcyanide?

119. Quaternary ammonium salt is used in production of . Watch Video Solution 120. How is aniline converted into fluorobenzene? Watch Video Solution

**121.** Account for the following

Methylamine in water reacts with ferric

chloride to precipitate hydrated ferric oxide.



#### **122.** Explain the following observations

Tertiary amines do not undergo acylation.



123. How aniline is obtained from benzoic acid?

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**124.** Give a chemical test to distinguish

between ethylamine and aniline.

**125.** What happens when acetamide is heated with phosphorus pentoxide and then hydrolyzed?



**126.** How will you prepare p-toluidine from toluene?

**127.** How is m-nitroaniline obtained from

nitrobenzene?

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**128.** Sulphanilic acid has acidic as well as basic groups, but it is soluble in alkali but insoluble in mineral acids.Explain.

**129.** Arrange the following in increasing order of their basic strength in aqueous solution :  $CH_3NH_2$ ,  $(CH_3)_2NH$ 



## **130.** What is the role of $HNO_3$ in the nitrating

mixture used for nitration of benzene?



**131.** Why is benzene diazonium chloride not stored and used immediately after its preparation?

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#### 132. Why aniline is soluble in aq. HCl?



**133.** Tert-butylamine cannot be prepared by the action of  $NH_3$  on tert-butylbromide. Give reason.



134. Explain : 2-aminoethanoic acid exists as a

dipolar ion as does p-amino sulphonic acid but

p-amino benzoic acid does not.



135. Amines are basic substances while amides

are neutral.Explain.



136. Aromatic amines are weaker bases than

aliphatic amines.

True / False

137. Why ethylamine is a stronger base than

methylamine?

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## 138. Why reactivity of $-NH_2$ group gets

reduced in acetanilide?

139. Alkylamines are stronger bases than arylamines.Explain.Watch Video Solution

#### 140. How would you convert methylamine into

ethylamine?



141. Why amines are more basic than the

comparable alcohols ?

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142. Account for the following

Methylamine in water reacts with ferric

chloride to precipitate hydrated ferric oxide.

143. It is difficult to prepare pure amines by

ammonolysis of alkyl halides.explain.

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144. Explain the following observations

Electrophilic substitution in case of aromatic

amines takes place more readily than benzene.



**148.** Illustrate the Gattermann reaction with example.



#### 149. Identify A and B in the following reaction.

Ans.  $C_2H_5C \equiv N \xrightarrow{\text{LiA}/H_4} C_2H_5 - CH_2NH_2$  $\xrightarrow{\text{HNO}_2} C_2H_5CH_2OH$ 

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150. What happens when nitrobenzene is

treated with  $LiAlH_4$ ?



151. Which compound is formed when benzene

diazonium chloride reacts with phenol in basic

medium?



**152.** Give a suitable example of acetylation.



# **154.** Write IUPAC name for

(i) 
$$CH_3 - CH - CH - CONH_2$$
  
 $|$   $|$   $|$   $NH_2$   $CH_3$ 

**155.** Write the IUPAC name of the given compound:

(ii) ON 
$$-\langle O \rangle - N(CH_3)_2$$

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#### **156.** Write IUPAC name of the following:

 $NH_2 - CH_2 - CH_2 - C \equiv C - CHO$ 







**158.** Write the IUPAC name of the following compound:



#### **159.** Write the IUPAC name of the following:

# $CH_3$ . $CH_2$ . $NH_2$

**160.** Write the IUPAC name of the following:



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161. Give IUPAC name of the following:

(vi) 
$$CH_3 - CH - CH_3$$
  
|  
 $NH_2$ 





# 162. Give the IUPAC name of the following: (vii) CH<sub>3</sub>·CH<sub>2</sub>·CH·CH<sub>2</sub>·NH<sub>2</sub> | CH,



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## **163.** Write the IUPAC name of the following:

(viii) 
$$CH_3(CH_2)_4^7 - CHCN$$
  
 $l$   
 $CH_3$ 



164. Write the IUPAC name of the following

compound:

 $n - C_4 H_9 N C$ 



**166.** What is the IUPAC name of the given compound?

(xii) 
$$CH_3 - CH_2 - CH_2 - N$$
  
 $C_2H_5$ 



167. What is the IUPAC name of the following:





169. How will you convert the following (II)

Aniline to N-phenylethanamide.

**170.** Why aniline is less basic than methyl amine?



171. Describe tests to distinguish between

secondary amine and tertiary amine.

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172. How will you convert nitrobenzene to

benzene?



175. How can you convert p-toluidine to 2-

bromo-4-methylaniline.





iodobenzene.



177. How will you get benzylamine from aniline.


# **178.** Arrange the following in decreasing order of their basic strength. $C_6H_5NH_2$ , $C_2H_5NH_2$ ,

 $\left(C_{2}H_{5}
ight)_{2}NH$ ,  $NH_{3}$ 

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179. Why do amines dissolve in mineral acids ?

180. What happens when an alkyl halide reacts

with  $AgNO_2$  and the product is reduced.



181. Compare the basic strength of an aliphatic

amine and ammonia.



**184.** What is vapour phase nitration?

#### 185. How can you convert acetic acid to methyl

amine?



## **186.** How will you convert Acetaldehyde to methane.

187. Do the conversion – Methyl amine →
Ethyl amine.
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188. Account for the following

Aromatic amines are weaker bases than

aliphatic amines.

189. Secondary amines are more basic than

primary amines.Explain.

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**190.** What is coupling reaction ? Give an example.

**O** Watch Video Solution

191. Write different uses of amine.



**192.** Give two methods of preparation of primary amines.

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**193.** What are nitrohydrocarbons.

**194.** How nitrohydrocarbons are prepared?



195. What is the difference between nitro and

nitrite compounds?

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**196.** How are nitroalkanes prepared from alkylhalides?



**199.** Illustrate the following reactions : (I)

Hydrolysis of alkyl cyanides



200. How will you prepare carboxylic acid form

amides.

201. illustrate Formation of amines from amides Watch Video Solution

#### 202. illustrate Formation fo alkyl cyanides from

amides



203. (I) Explain reduction of nitroalkanes withequations.

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 204. Secondary nitro alkanes react with

nitrous acid to give :



205. (I) How can you prepare aniline from (I)

nitrobenzene (II) phenol (III) benzamide.

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#### 206. Give alkylation and acylation on $-NH_2$

group and halogenation as well as

sulponation on benzene nucleus of aniline.

207. (I) What is diazonium salt ? Give its preparation.

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208. Give three synthetic uses of benzene

diazonium chloride



**209.** Starting from nitrobenzene how will you prepare benzene diazonium chloride ? Give the method of synthesis of (i) p-hydroxy azobenzene and (ii) fluorobenzene from benzene diazonium chloride.

