



CHEMISTRY

BOOKS - IIT-JEE PREVIOUS YEAR

(CHEMISTRY)

ALIPHATIC COMPOUNDS CONTAINING NITROGEN

Jee Main And Advanced

1. The order of basicity among the the following compounds is



A. $II > I > IV > III$

B. $I > IV > III > I$

C. $IV > I > II > I$

D. $IV > I > II > III$

Answer: (d)



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2. In the Hofmann-bromamide degradation reaction, the number of moles of NaOH and Br_2 used per mole of amine produced are

A. four moles of NaOH and two moles of

Br_2

B. two moles of NaOH and two moles of Br_2

C. four moles of NaOH and one mole of

Br_2

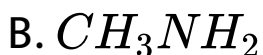
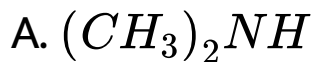
D. one mole of NaOH and one mole of Br_2

Answer: (c)



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3. Considering the basic strength of amines in aqueous solution ,which one has the smallest pK_b value?



Answer: (a)



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4. On heating an aliphatic primary amine with chloroform and ethanolic potassium hydrozide, the organic compound formed is

- A. an alkanol
- B. an alkanediol
- C. an alkyl cyanide
- D. an alkyl isocyanide

Answer: (d)



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5. The gas leaked from a strong tank of the Union Carbide plant in Bhopal gas tragedy was

A. methyl isocyanate

B. methylamine

C. ammonia

D. phosgene

Answer: (a)



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6. The major product of the following reaction

is 

A. 

B. 

C. 

D. 

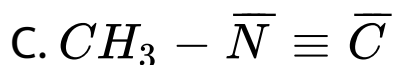
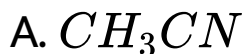
Answer: (a)

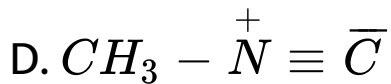


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7. In the following reaction,

$CH_3NH_2 + CHCl_3 + KOH \rightarrow$ Nitrogen
containing compound $+ KCl + H_2O$. The
nitrogen containing compound is





Answer: (d)



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8. Benzamide on reaction with $POCl_3$ gives

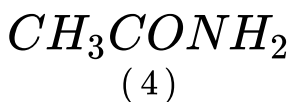
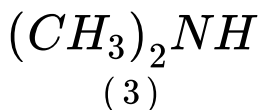
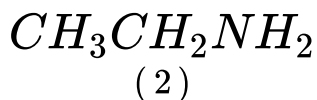
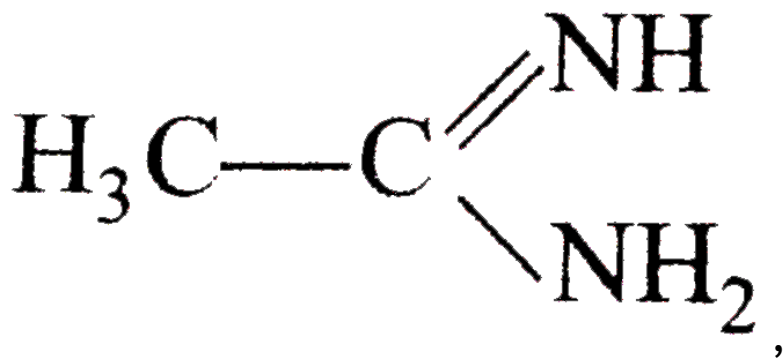
- A. aniline
- B. benzonitrile
- C. chlorobenzene
- D. benzyl amine

Answer: (b)



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9. The correct order of basicities of the following compounds is



A. $2 > 1 > 3 > 4$

B. $1 > 3 > 2 > 4$

C. $3 > 1 > 2 > 4$

D. $1 > 2 > 3 > 4$

Answer: (b)



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10. A positive carbylmine test is given by

A. N,N- dimethylaniline

B. 2,4-dimethy laniline

C. N-methy1-o-methylaniline

D. p-methylbenzylamine

Answer: (d)



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11. p-chloro aniline and anilinium

hydrochloride can be distinguished by

A. Sandmeyer reaction

B. $NaHCO_3$

C. $AgNO_3$

D. Carbylamine test

Answer: (c)



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12. Carbylamine test is performed in alc .

KOH by heating a mixture of :

A. chloroform and silver powder

B. trihalogenated methane and a primary amine

C. an alkyl cyanide and a primary amine

D. an alkyl cyanide and a primary amine

Answer: (b)



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13. Acetamide is treated separately with the following reagents. Which one of these would give methyl amine ?

A. PCl_5

B. Sodalime

C. $NaOH + Br_2$

D. Hot, cone H_2SO_4

Answer: (c)



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14. The compound which on reaction with aqueous nitrous acid at low temperature produces an oily nitrosamine, is

A. methy lamine

B. ethylamine

C. diethylamine

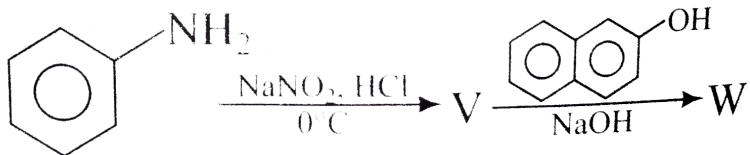
D. trirthylamine

Answer: (c)



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15. In the following reactions the major product W is



A. 

B. 

C. 

D. 

Answer: (a)



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16. A positive carbylmine test is given by

A. N,N-dimethyl aniline

B. 2,4- dimethyl aniline

C. N-methyl-O- methyl aniline

D. p-methyl benzy amine

Answer: (b,d)



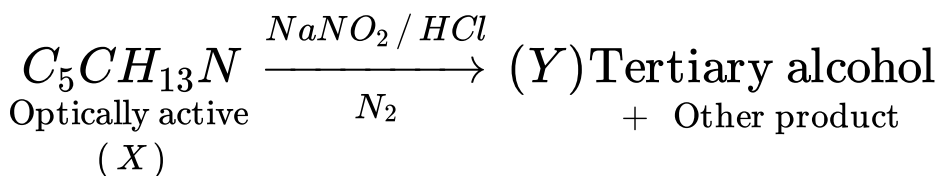
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17. match each of the compounds in column I with its characteristic reaction(S) in columnII.



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18.



Find (X) and (Y). Is (Y) optically active? Write the intermediate steps.



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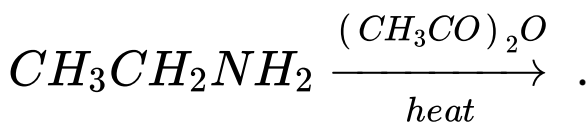
19. Give reasons for the following in one or two sentence .

Dimethy lamine is a stronger base then trimethy lamine .



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20. The products (*A*) and (*B*) of the reaction



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21. Write the structure of the foul-smelling compound obtained when aniline is treated with chloroform in the presence of KOH .



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22. Give the structure of (A) (explanations are not required). $A(C_3H_9N)$ reacts with benzenesulphonyl chloride to give a solid insoluble in alkali'.



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23. Arrange the following in increasing order of basic strength: methylamine, dimethylamine, aniline, N-methylaniline",



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24. Give a chemical test and the reagents used to distinguish between the following :
'Ethylamine and diethylamine'



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25. For nitromethane molecule, write structures

(i) showing significant resonance stabilisation

(ii) indicating tautomerism



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26. State the equation for the preparation of following compounds: n-propylamine from ethyl chloride.



27. Treatment of compound o with $KMnO_4/H^+$ gave P, which on heating with ammonia gave Q. The compound Q on treatment with $Br_2/NaOH$ produced R. On strong heating, Q gave S, which on further treatment with ethyl 2-bromopropanate in the presence of KOH followed by acidification, gave acidification, gave a compound T.4



The compound R is

A. 

B. 

C. 

D. 

Answer: (a)



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28. Treatment of compound o with $KMnO_4/H^+$ gave P, which on heating with ammonia gave Q. The compound Q on

treatment with $Br_2 / NaOH$ produced R. On strong heating, Q gave S, which on further treatment with ethyl 2-bromopropionate in the presence of KOH followed by acidification, gave acidification, gave a compound T.4



The compound T is

A. glycine

B. alanine

C. valine

D. serine

Answer: (b)



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29. Ethyl methylamine cannot be resolved under normal conditions because.

A. The favoured configuration is not chiral

B. it isomerizes rapidly with the achiral

isomer trimethylamine

C. The nitrogen atom rapidly inverts its configuration leading to a racemic mixture

D. The C-N bond is not stable under conditions used for resolution

Answer: (c)



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30. Dibutylamine, $(C_4H_9)_2NH$, and anisole $C_5H_5OCH_3$, have similar boiling points, and are relatively insoluble in water. How might a

mixture of these compounds be separated into the pure components?

A. (i) Dissolve mixture in ether,

(ii) Extract the anisole into 10% aqueous

NaOH

B. (i) Dissolve mixture in ether,

(ii) Extract the amine into 10% aqueous

HCl

C. (i) Dissolve mixture in ether ,

(ii) Extract the amine into 10% aqueous

NaOH

D. (i) Dissolve mixture in ether ,

(ii) Extract the anisole into 10%

aqueous HCl

Answer: (b)



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31. In order to prepare a 1°- amine incorporating an additional CH_2 group from

an alkyl halide, What reagent is often used as the nitrogen source?

A. Sodium amide $NaNH_2$

B. Sodium azide, NaN_3

C. potassium cyanide, KCN

D. Potassium phthalimide, $C_6H_4(CO)_2NK$

Answer: (c)



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32. What reagent is used In the Hinsberg's test of amines?

A. $(CH_3CO)_2 O$ and pyridine

B. $C_6H_5SO_2Cl$ in aq .NaOH

C. $NaNO_2$ in aq H_2SO_4

D. CH_3I (excess) follwed by AgOH

Answer: (b)



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33. Which of the following procedures would be best for preparing dimethylcyclohexylamine, $C_6H_{11}N(CH_3)_2$?

A. (i) Dimethylamine + cyclohexylbromide in ether

(ii) $NaBH_3CN$ in methanol

B. Dimethylamine + cyclohexylbromide in ether

C. Cyclohexylbromide + $2CH_3I$ in ether

D. (i) Cyclohexylbromide+NaCN in methanol

(ii) $2CH_3Li \in THF$

Answer: (a)

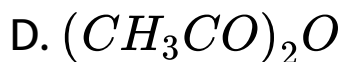


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34. Primary amine can be distinguished from a secondary amine using the reagents

A. $NaNO_2 / HCl$

B. $CHCl_3 / KOH$



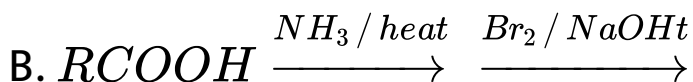
Answer: (a,b,c)



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35. Which of the following reaction Would product a primary amine?

A. 



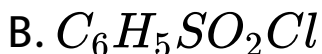


Answer: (a,b,c,d)



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36. A tertiary amine can be separated from a mixture of primary and tertiary amine using



C. H_2SO_4

D. KOH

Answer: (a,b)



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37. Assertion A primary amine on treatment with $NaNO_2 / HCl$ gives a primary alcohol.

reason Reaction proceeds via carbocation intermediate.

A. Both assertion and reason are correct and reason is the correct explanation of the assertion.

B. Both assertion and reason are correct and reason is the correct explanation of the assertion.

C. Assertion is correct but reason is incorrect.

D. Assertion is incorrect but reason is correct.

Answer: (d)



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Type 2

1. The major product of the reaction is 

A. 

B. 

C. 

D. 

Answer: (c)

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Chapter Test

1. Assertion $CH_3CH_3(CH_3)NCH_2CH_2CH_3$ on treatment with aqueous HCl produces two stereo isomeric quaternary ammonium salts. Reason salts will have a chiral centre.

A. Both assertion and reason are correct and reason is the correct explanation of the assertion.

B. Both assertion and reason are correct and reason is the correct explanation of the assertion.

C. Assertion is correct but reason is incorrect.

D. Assertion is incorrect but reason is correct.

Answer: (a)



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