

CBSE Class 12 Chemistry Chapter 13 Amines Worksheet with Answer– Set 1

Q1. In the conversion of $\text{C}_2\text{H}_5\text{Br} \rightarrow \text{C}_2\text{H}_5\text{CN}$, the reagent used is

- (a) Alcoholic potassium cyanide
- (b) Alcoholic silver cyanide
- (c) Ammonia
- (d) None of the above

Answer:

(a) In the conversion of $\text{C}_2\text{H}_5\text{Br} \rightarrow \text{C}_2\text{H}_5\text{CN}$, the reagent used is alcoholic potassium cyanide.

Q2. The reduction of methyl cyanide with sodium and alcohol gives

- (a) Methyl amine
- (b) Ethyl amine
- (c) Acetic Acid
- (d) None of the above

Answer:

(b) The reduction of methyl cyanide with sodium and alcohol gives ethyl amine.

Q3. An aliphatic organic compound containing carbon, hydrogen and nitrogen reacts with dilute hydrochloric acid to produce formic acid. It is then reduced to dimethyl amine by platinum or nickel and undergoes an addition reaction with chlorine and sulphur. The compound can be

- (a) Methyl isocyanide
- (b) Methyl cyanide
- (c) Methyl amine
- (d) None of the above

Answer:

(a) The aliphatic organic compound is methyl isocyanide.

Q4. Ethyl isocyanide can be prepared by reacting

- (a) Ethyl bromide and hydrogen cyanide
- (b) Ethyl bromide and potassium cyanide
- (c) Ethyl bromide and silver cyanide

(d) None of the above

Answer:

(c) Ethyl isocyanide can be prepared by reacting ethyl bromide and silver cyanide.

Q5. In the reaction between ethyl bromide and silver nitrite, the product obtained is

- (a) Ethane
- (b) Nitro ethane
- (c) Ethyl nitrite
- (d) None of the above

Answer:

(b) In the reaction between ethyl bromide and silver nitrite, the product obtained is nitro ethane.

Q6. Write the IUPAC name of CH_3NC .

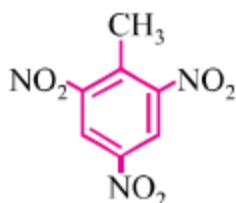
Answer:

The IUPAC name of CH_3NC is methane carbylamine.

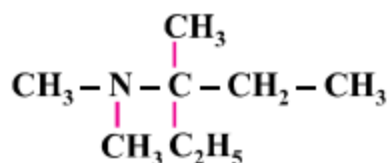
Q7. Draw the structure of TNT.

Answer:

The structure of TNT is given below.



Q8. Write the IUPAC name of the following compound.



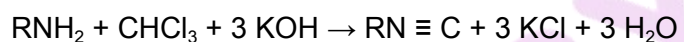
Answer:

The IUPAC name of the compound mentioned above is 3- N- Methyl- N, N-dimethyl Penta amine.

Q9. How will you test the presence of primary amine?

Answer:

We can use the carbyl amine test to determine the presence of a primary amine.



Q10. Why does aniline not undergo Friedel Crafts's reaction?

Answer:

Aniline does not undergo Friedel Crafts's reaction because aniline is basic. It can form an adduct with AlCl_3 . Thus, electrophiles cannot be generated, leading to the unoccurrence of the Friedel Crafts's reaction.

Q11. Why electrophilic substitution in aromatic amines takes place more readily than in benzene?

Answer:

Electrophilic substitution in aromatic amines takes place more readily than in benzene because NH_2 is an electron-releasing group. It increases the electron density. Thereby electrophilic substitution takes place faster.

Q12. Why do nitro compounds have higher boiling points than hydrocarbons of comparable molecular mass?

Answer:

Nitro compounds have higher boiling points than hydrocarbons of the comparable molecular mass because nitro compounds are more polar than hydrocarbons and therefore have more van der Waals forces of attraction.

Q13. Why is aniline a weaker base than cyclohexyl amine?

Answer:

Aniline is a more fragile base than cyclohexyl amine because, in aniline, the lone pair of electrons of nitrogen is delocalised over the benzene ring. As a result, the electron density of the nitrogen decreases.

But in cyclohexylamine, the lone pair of electrons on the nitrogen atom is readily available due to the absence of resonance. Hence aniline is a weaker base than cyclohexylamine.

Q14. Why is an alkylamine more basic than ammonia?

Answer:

An alkyl amine is more basic than ammonia because of the electron releasing inductive effect (+I) of the alkyl group, the electron density on the nitrogen atom increases, and thus, it can donate the lone pair of electrons more easily than ammonia.

Q15. Write the IUPAC name of the $(\text{CH}_3)_2\text{N}-\text{CH}_2\text{CH}_3$?

Answer:

The IUPAC name of $(\text{CH}_3)_2\text{N}-\text{CH}_2\text{CH}_3$ is N, N Dimethyl amine.

Q16. Write chemical equations for the following reactions.

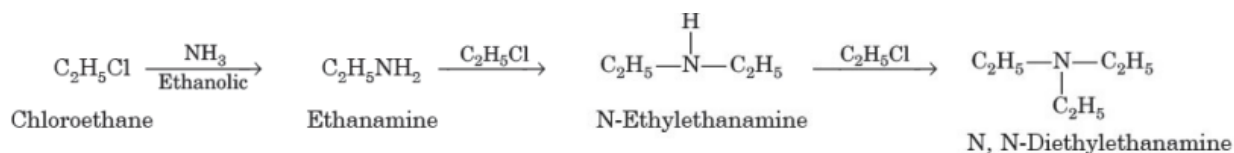
(a) Reaction of ethanolic ammonia with ethyl chloride.

(b) Ammonolysis of benzyl chloride followed by reaction with chloroform.

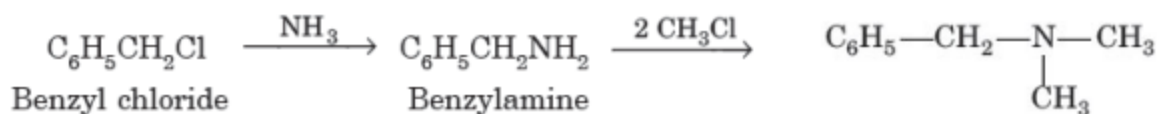
Answer:

The chemical equations for the above reaction are mentioned below.

(a) Reaction of ethanolic ammonia with ethyl chloride.



(b) Ammonolysis of benzyl chloride followed by reaction with chloroform.



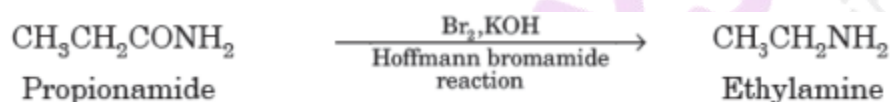
Q17. Convert the following.

(a) Propionamide to ethyl amine

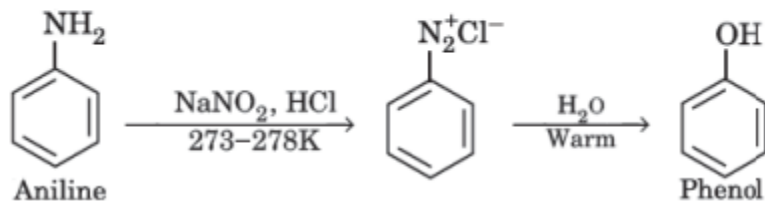
(b) Aniline to phenol

Answer:

(a) We can convert propionamide to ethyl amine by the Hoffmann bromamide reaction, i.e. reacting with bromine and KOH.



(b) We can convert aniline to phenol by reacting it with the nitrous acid, followed by hydrolysis.

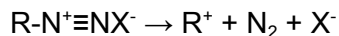


Q18. (a) Why can't we form primary amine diazonium salt?

(b) Why is it essential to keep the temperature very low (273 - 278 K) during diazonium salt formation?

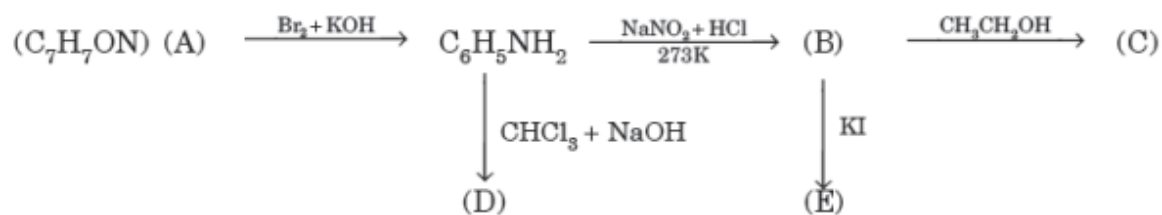
Answer:

(a) We can not form primary amine diazonium salt because they are highly unstable alkane diazonium salts. It decomposes to carbocation and nitrogen gas even at low-temperature (273-278 K).



(b) It is essential to keep the temperature very low (273 - 278 K) during diazonium salt formation because if the temperature is more than 278 K, amine converts phenol with the evolution of the nitrogen gas.

Q19. An aromatic compound A of molecular formula C_7H_7ON undergoes a series of reactions shown below. Write the structure of A, B, C, D, and E in the following reactions.



Answer:

Here,

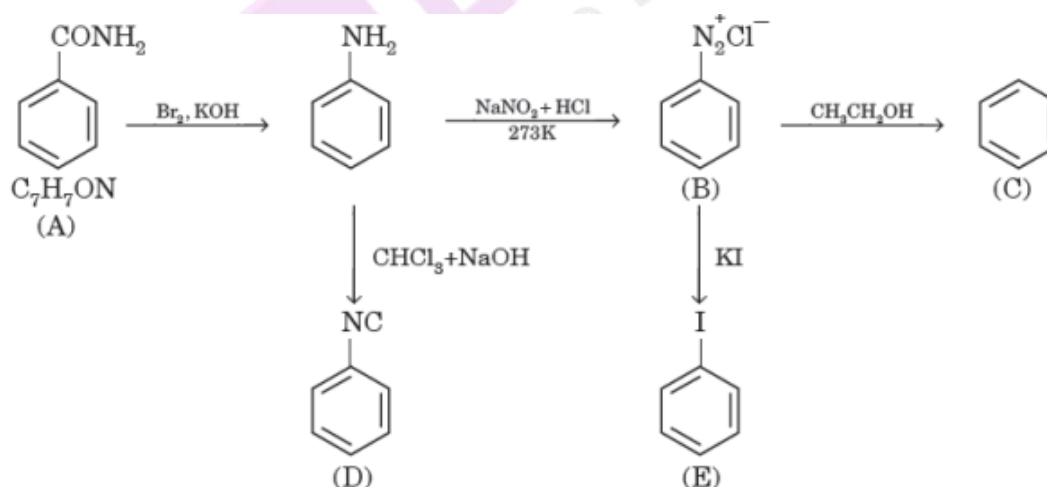
A = Benzamide

B = Benzene diazonium chloride

C = Benzene

D = Benzene isocyanide

E = Iodo benzene



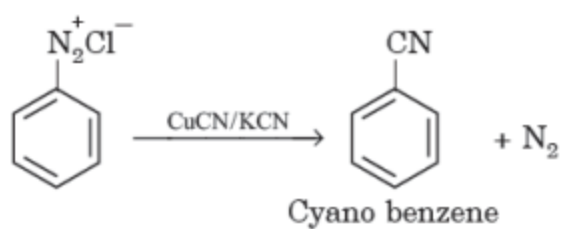
Q20. What happens when

(a) Benzene diazonium chloride reacts with $CuCN/KCN$.

(b) Benzene diazonium chloride reacts with water

Answer:

(a) If benzene diazonium chloride reacts with $CuCN/KCN$, cyano benzene and nitrogen gas are evolved.



(b) If benzene diazonium chloride reacts with water, phenol, hydrochloric acid, and nitrogen gas, are evolved.

