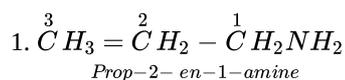


Solution

AMINES - CENTUM CYCLIC UNIT TEST

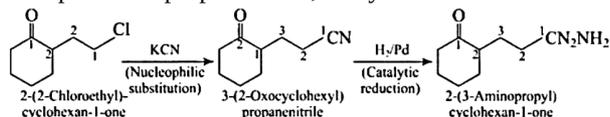
Class 12 - Chemistry



2. The primary amine among the given compounds is $(\text{C}_2\text{H}_5)_2\text{CHNH}_2$.

In this compound, $(\text{C}_2\text{H}_5)_2\text{CHNH}_2$, you can see that the nitrogen atom (N) is bonded to two hydrogen atoms (H) and one carbon atom (C), which is the defining characteristic of a primary amine. Primary amines have the general structure R-NH_2 , where R represents an alkyl or aryl group. In this case, $(\text{C}_2\text{H}_5)_2\text{CH}$ represents the alkyl group, and NH_2 represents the amino group bonded to the primary carbon.

3. Compound A -propanenitrile, B- cyclohexan-1- one

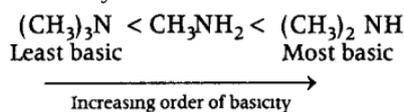


4. N,N-Dimethylpropan-1-amine

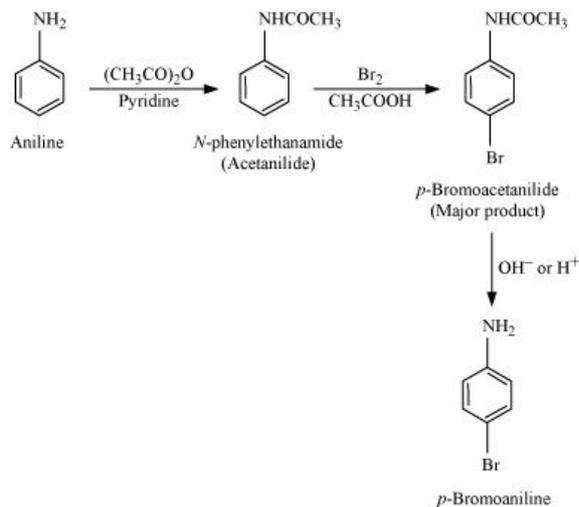
5. RO^- ion is more stable and favours the ionization of alcohols whereas RNH^- ion is less stable due to lesser electronegativity of nitrogen. Hence amines are less acidic than alcohols.

6. Due to resonance electron density increases at ortho and para positions.

7. Basicity increases with an increase in the number of R groups but 3° amine is least basic due to steric hindrance. Thus, the order of basicity is

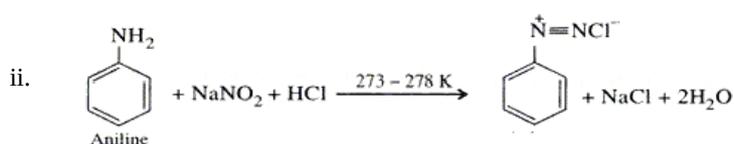
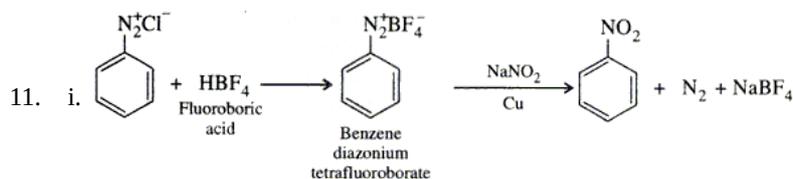


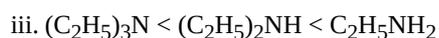
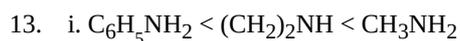
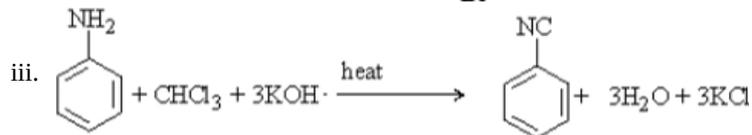
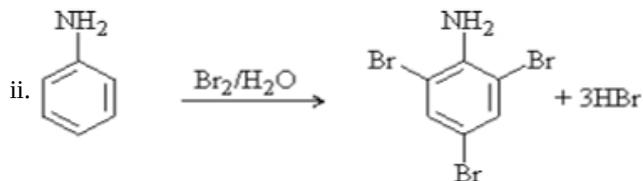
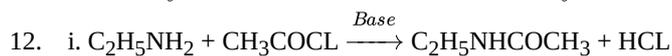
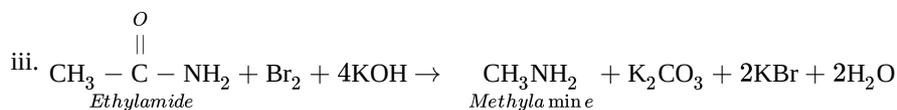
8. N,N-dimethylaniline OR N,N-dimethylbenzenamine



9.

10. Due to the presence of intermolecular hydrogen bonding in primary amines which is absent in tertiary amines.

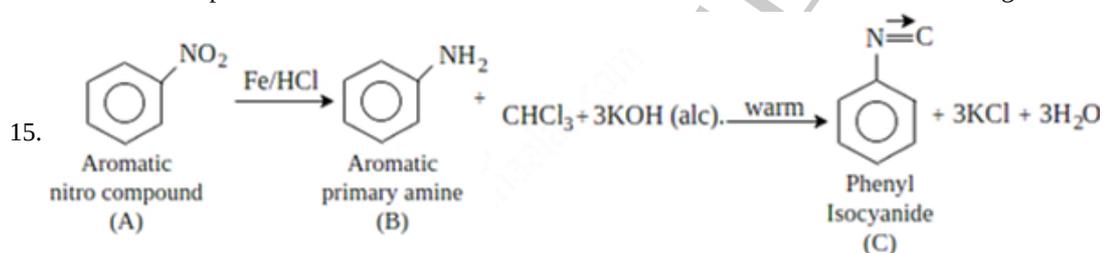




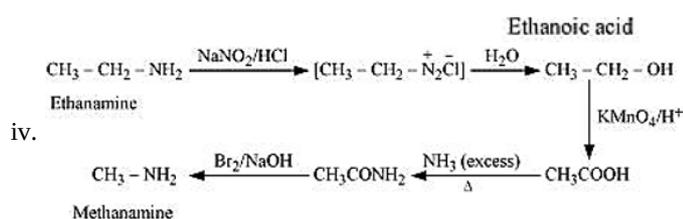
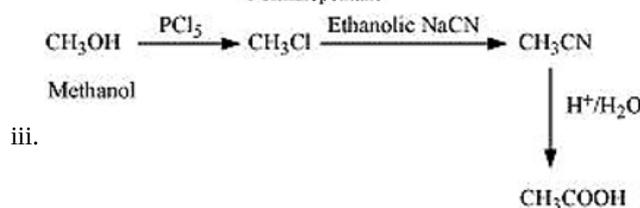
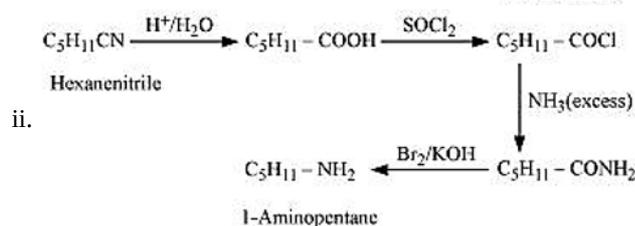
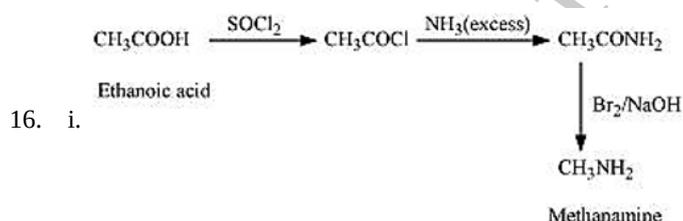
14. i. Because it gives a mixture of amines which is difficult to separate.

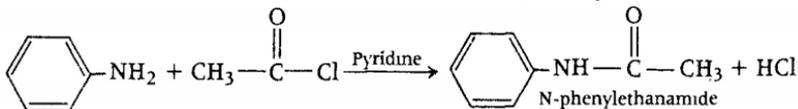
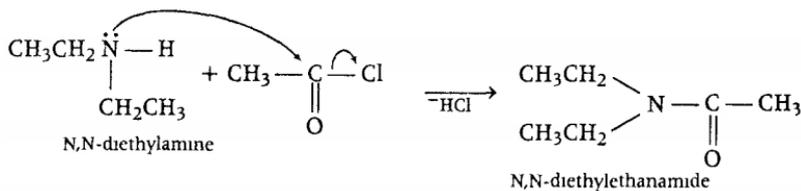
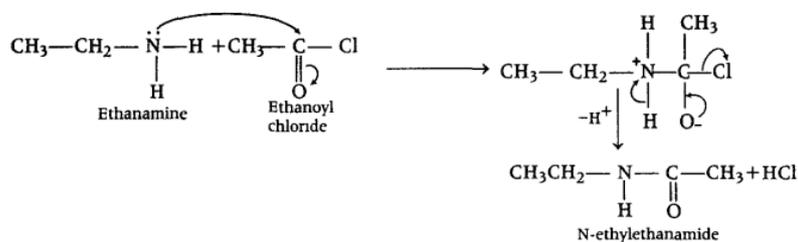
ii. Aniline is a Lewis base and it reacts with AlCl_3 to form a salt.

iii. Because of protonation of aniline / formation of anilinium ion which deactivates the ring.



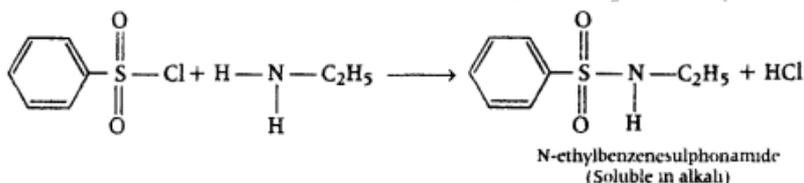
The compound A is Nitrobenzene, B is Aniline and C is Phenyl isocyanide.





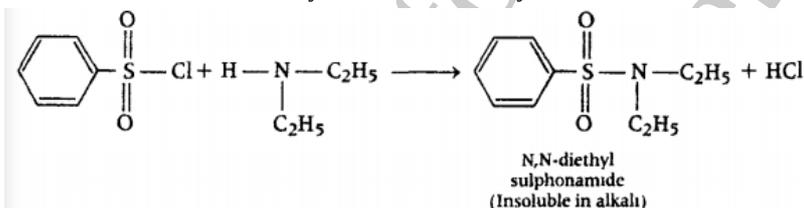
ii. The reaction of primary and secondary amines with benzenesulphonyl chloride ($\text{C}_6\text{H}_5\text{SO}_2\text{Cl}$, known as Hinsberg's reagent to form sulphonamides is known as Hinsberg's method (or reaction). This method (or reaction) is used for separating 1° , 2° and 3° amines.

a. The reaction of benzenesulphonyl chloride with primary amine yields N-ethylbenzenesulphonamide.



The hydrogen attached to N-atom in sulphonamide is strongly acidic due to the presence of strong electron withdrawing sulphonyl group. Hence, it is soluble in alkali.

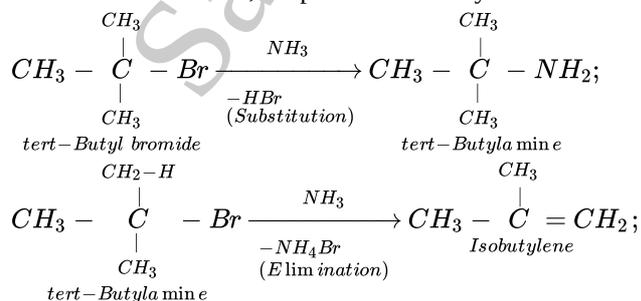
b. In the reaction with secondary amine, N, N-diethylbenzenesulphonamide is formed.



Since, N, N-diethylbenzenesulphonamide does not contain any hydrogen atom attached to nitrogen atom, it is not acidic and hence, insoluble in alkali.

c. Tertiary amines do not react with benzenesulphonyl chloride, as it doesn't contain replaceable hydrogens.

19. i. Tert-Butyl bromide being a 3° alkyl halide on treatment with a base (i.e., NH_3) prefers to undergo elimination rather than substitution. Therefore, the product is isobutylene rather than tert-butylamine.



ii. 1° amines containing tert-alkyl groups can be prepared by action of suitable Grignard reagents and o-methylhydroxylamine.

For example,

