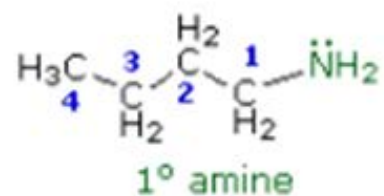




Amine compounds

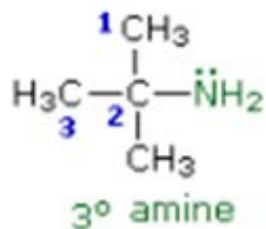
Nomenclature of Amines

aliphatic amine

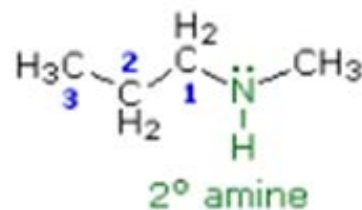


1-aminobutane

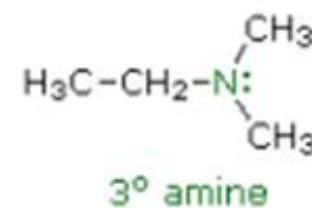
IUPAC name



2-amino-2-methylpropane



1-methylaminopropane



dimethylaminoethane

Common name

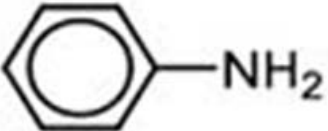

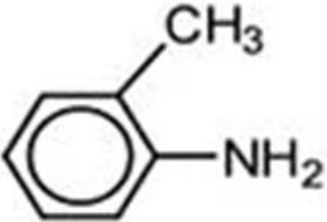
n-butylamine

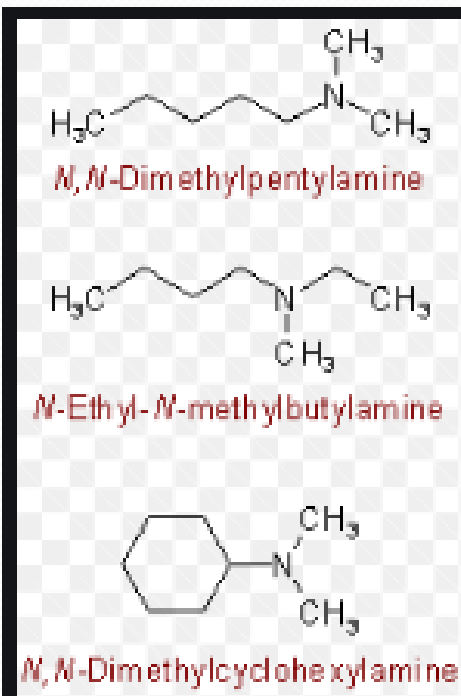
tert-butylamine

methylpropylamine

ethyldimethylamine

aromatic amine

		
aniline	p-nitroaniline	o-methylaniline



N,N-Dimethylpentylamine •

N-Ethyl-*N*-methylbutylamine •

N,N-Dimethylcyclohexylamine •

Physical Properties of Amines

1-The lower aliphatic amines are gaseous in nature with a fishy smell. Primary amines with three or four carbon atoms are liquids at room temperature whereas higher ones are solids.

2-Aniline and other arylamines are generally colourless, but they get coloured if stored in open due to atmospheric oxidation.

3-Lower aliphatic amines can form hydrogen bonds with water molecules hence they are soluble in water. Increase in size of hydrophobic alkyl part increases the molar mass of amines which results in a decrease in its solubility in water. Higher amines are insoluble in water.

4-Organic solvents like alcohol, benzene, and ether readily dissolve amines. Alcohols have higher polarity as compared to amines and hence they form stronger intermolecular hydrogen bonds.

5-Primary and secondary amines are often engaged in the intermolecular association as a result of hydrogen bonding between nitrogen of one and hydrogen of the other molecule.

The intermolecular association is more prominent in case of primary amines as compared to secondary due to the availability of two hydrogen atoms.

In tertiary amines, there is no intermolecular association due to the absence of free hydrogen atom for bonding. The order of boiling point of amines is as follows:
Primary > Secondary > Tertiary..

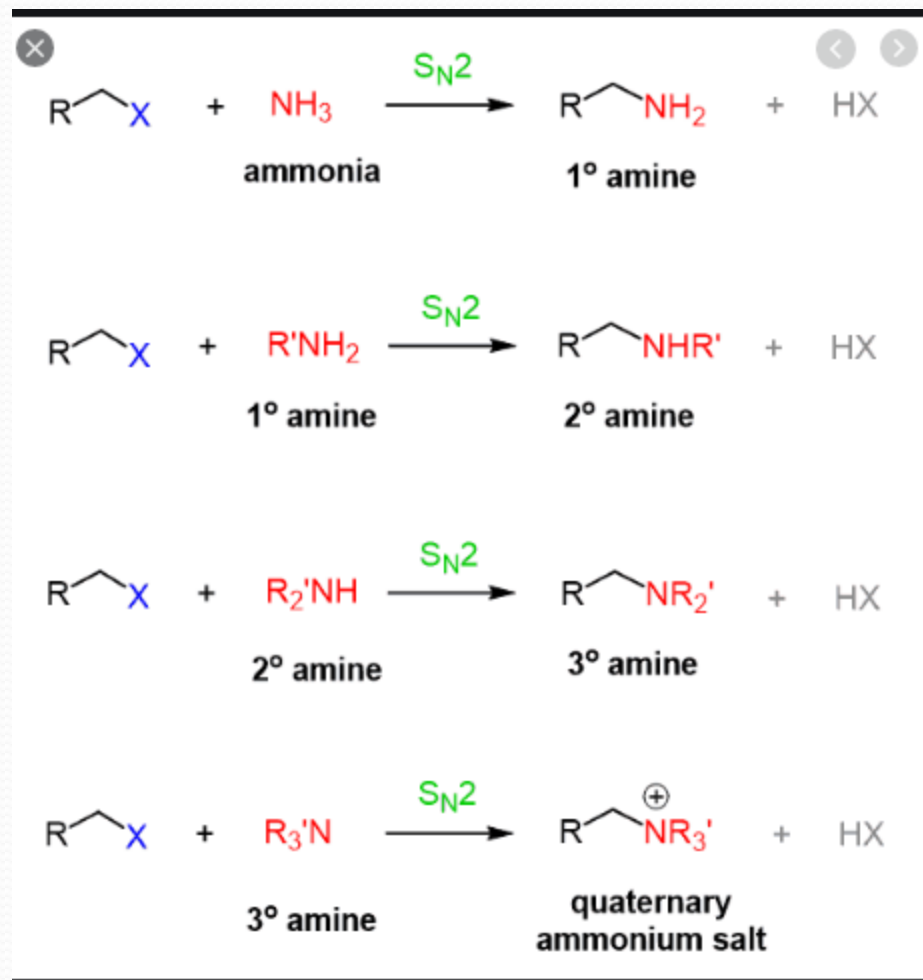


Chemical properties of amine compounds

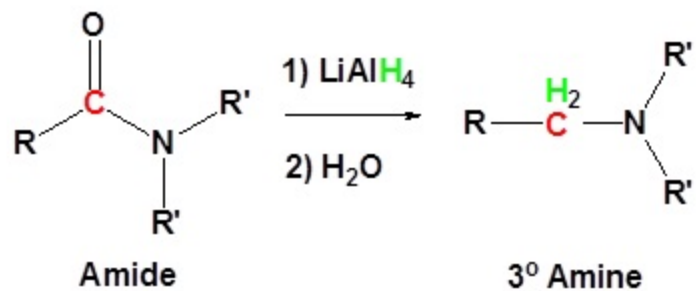
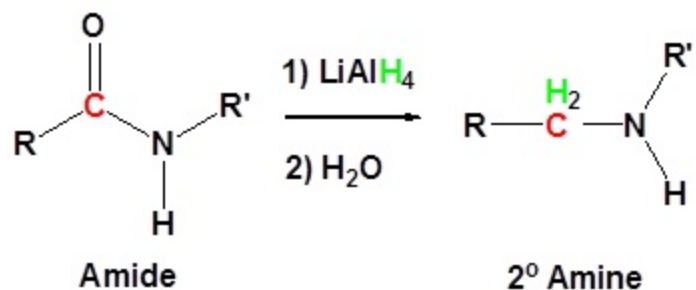
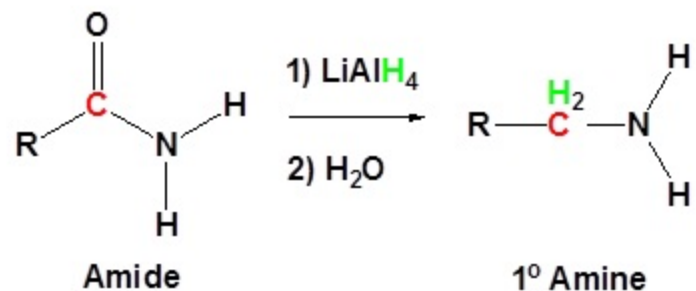
1-Amine compounds can hydrogen bond, which affords them solubility in water and elevated boiling points. The general structure of an amine is a nitrogen atom with a lone pair of electrons and three substituents. However, the nitrogen may bind to four substituents, leaving a positive charge on the nitrogen atom.

2-Amines are aliphatic and aromatic derivatives of ammonia. Amines, like ammonia, are weak bases. This basicity is due to the unshared electron pair on the nitrogen atom.

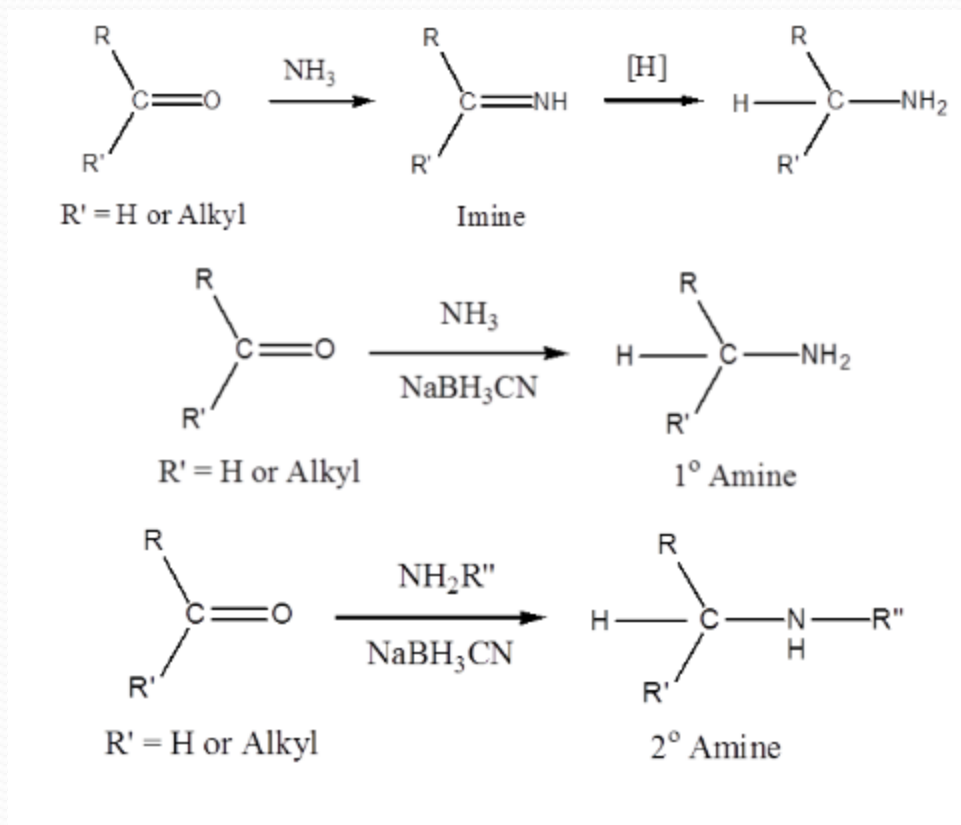
• 2-Preparation of Amines



- 2- Synthesis of amine from amide



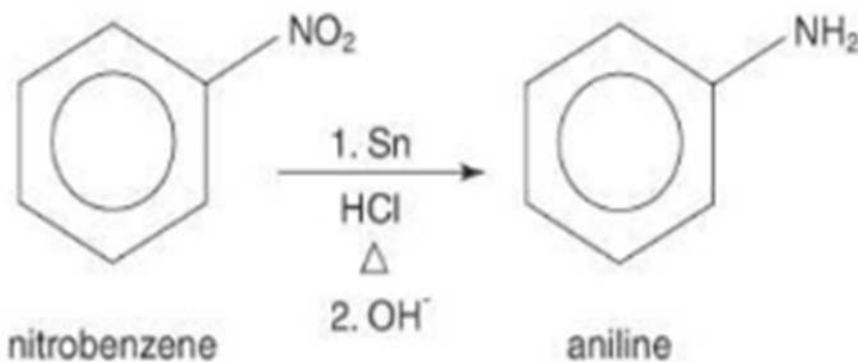
- 3- Synthesis of amine from ketone



• 3- synthesis of aromatic amine

1. Reduction of nitro compounds - gives 1° amines

- ✦ Aromatic amines are normally prepared by reduction of the corresponding aromatic nitro compound.
- ✦ Aniline is prepared from nitrobenzene.



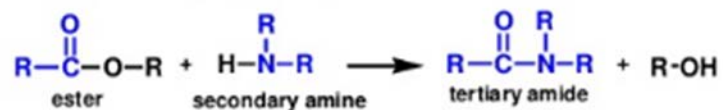
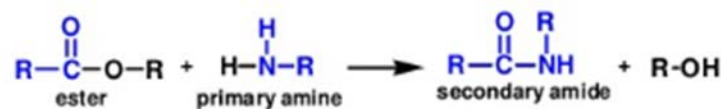
- ✦ Reducing agents: Fe/H^+ , Sn/H^+ or catalytic hydrogenation (example, H_2/Pd or Pt or Ni).

REACTION OF AMINES

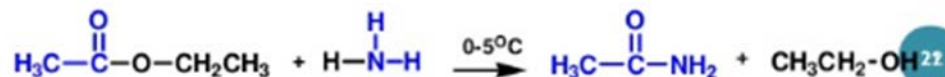
1. Formation of amides

a. From ester

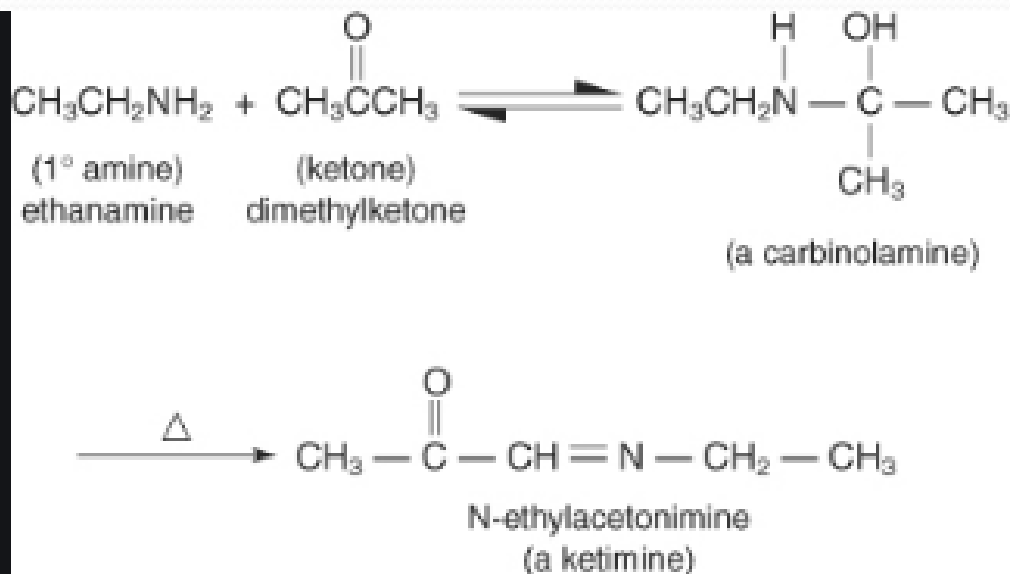
Esters react with ammonia, primary and secondary amines to produce **amides and alcohols**.



EXAMPLE



- Reaction of amine with aldehyde and ketone



SCHIFF BASE

Reaction of aromatic amine

