Amines

$-\ddot{N}-$ a nitrogen bonded to three things (hydrogens or carbons) with one pair of unshared electrons

- trigonal pyramidal geometry
- $C_nH_{2n+3}N$
- nomenclature: NH
  - common name is naming the alkyl groups "methyl ethyl amine
  - IUPAC name is smaller alkyl group + longer "N-methyl ethanamine
- neutralization of amines forms an amine salt:

$$NH_2 + HCl \rightarrow NH_3^+Cl^-$$

amine + acid → amine salt

- amine salt + base → uncharged amine "free base"

$$NH_3^+Cl^- + NaOH \rightarrow NH_2 + NaCl + H_2O$$

- in ammonium cations, the geometry is tetrahedral:

$$NH_3 + H_2O \rightarrow NH_4^+ + OH^-$$

property of bases: forms -OH in water

Amides

$R-\overset{O}{\overset{\|}{C}}NH_2$

- a nitrogen directly attached to a carbonyl carbon
- nomenclature:

N,N-dimethyl propanamide

- amidation:

amine + carboxylic acid → amide + water

$$NH_2 + OH \rightarrow NH + H_2O$$

amino acids

$H_2N-\overset{R}{\overset{|}{C}}-COOH$
H

- group according to sidechain (R)... this determines the amino acid
- peptide bonds link the residues together

ex. tripeptide

$$H_3N^+-\overset{R}{\overset{|}{C}}-\overset{O}{\overset{\|}{C}}-\overset{H}{N}-\overset{R}{\overset{|}{C}}-\overset{O}{\overset{\|}{C}}-\overset{H}{N}-\overset{R}{\overset{|}{C}}-COO^-$$

N terminus

C terminus

peptide bonds