

CAIE Chemistry A-level

34: Nitrogen Compounds

(A-level only)

Definitions

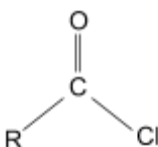
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Definitions and Concepts for CAIE Chemistry A-level Nitrogen Compounds

Acyl chloride: A compound containing the functional group COCl . Acyl chlorides are a derivative of carboxylic acids, but the $-\text{OH}$ is substituted by $-\text{Cl}$.



Amines: Compounds that contain the NR_3 functional group (where R could be hydrogen atoms or alkyl chains). Amines are basic as the nitrogen atom has a lone pair of electrons that can accept a proton. In a reaction between amines and dilute acids, salts are formed.

Amino acid: An organic compound containing both a carboxyl group ($-\text{COOH}$) and an amino group ($-\text{NH}_2$).

Azo compound: Molecules with the functional group $\text{R}-\text{N}=\text{N}-\text{R}'$.

Condensation: A reaction where two molecules join to form a larger molecule, whilst also creating a small molecule as a byproduct.

Diazonium salt: Compounds which contain the functional group $\text{R}-\text{N}_2^+ \text{X}^-$.

Dipeptide: A compound made up of two amino acids joined by a peptide (amide) bond.

Halogenoalkane: A saturated molecule where one or more of the hydrogen atoms in an alkane has been substituted for a halogen.

Hydrolysis: A reaction in which water is used to break down a compound.

Isoelectric point: The pH at which a molecule is neutral or does not have a charge. For an amino acid, this is when it is a zwitterion.

Nitration: A reaction that involves the addition of a nitro group.

pH: A value that represents the acidity or alkalinity of a solution. Acidic solutions have a pH of less than 7 while alkali solutions have a pH of greater than 7. Neutral solutions have a pH of 7.

$$\text{pH} = -\log[\text{H}^+]$$

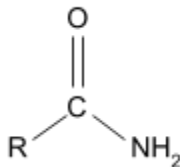
$$[\text{H}^+] = 10^{-\text{pH}}$$





Phenol: Phenol is an aromatic ring with an OH group attached.

Primary amide: A molecule containing the functional group -CONH_2 , as shown below.



Primary amine: An organic compound that contains the functional group RNH_2 (where R is an alkyl chain).

Protein: A molecule made up of amino acids joined by peptide bonds.

Reduction: The gain of electrons/decrease in oxidation number.

Secondary amine: An organic compound that contains the functional group R_2NH (where R is an alkyl chain).

Tertiary amine: An organic compound that contains the functional group R_3N (where R is an alkyl chain).

Tripeptide: A compound made up of three amino acids joined by peptide (amide) bonds.

Zwitterion: A dipolar ion with a positive charge in one part of the molecule and a negative charge in another part of the molecule. The zwitterionic form of an amino acid is the state in which the amine group has a positive charge ($^+\text{NH}_3$) and the carboxyl group has a negative charge (COO^-).

