

# CAIE Chemistry A-level

## 16: Hydroxy Compounds Definitions

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## Definitions and Concepts for CAIE Chemistry A-level Hydroxy Compounds

**Alcohol:** An organic molecule with the functional group -OH.

**Aldehyde:** A compound containing the -CHO functional group at the end of an alkyl chain. Aldehydes can be oxidised to carboxylic acids by heating them under reflux with  $\text{Cr}_2\text{O}_7^{2-}/\text{H}^+$ .

**Alkene:** A homologous series of unsaturated hydrocarbons with the general formula  $\text{C}_n\text{H}_{2n}$ .

**Carboxylic acid:** An organic compound containing the -COOH functional group.

**Catalyst:** A substance that increases the rate of a reaction without being changed in chemical composition or amount. They work by providing an alternative reaction pathway with a lower activation energy.

**Combustion:** A reaction in which the carbon and hydrogen within fuels are oxidised to release energy and to produce carbon dioxide and water.

**Dehydration:** A type of reaction which involves the loss of water.

**Diol:** A molecule with two alcohol functional groups.

**Distillation:** A technique used to purify a liquid by heating and cooling. When the liquid evaporates it moves into a condenser where it is cooled, recondensed and collected.

**Electrophilic addition:** A reaction where a  $\pi$  bond is broken and 2 new  $\sigma$  bonds form due to the addition of an electrophile.

**Ester:** A compound containing the R-COO-R' functional group (where R and R' are alkyl groups).

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

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

**Ketone:** A compound containing the C=O functional group within an alkyl chain. Ketones cannot be oxidised further.

**Oxidation:** Process involving the loss of electrons. Results in an increase in oxidation number.





**Primary alcohol:** An alcohol in which the -OH is attached to a primary carbon atom (i.e.  $\text{RCH}_2\text{OH}$ ). Primary alcohols can be oxidised with  $\text{Cr}_2\text{O}_7^{2-}/\text{H}^+$  to form either an aldehyde or a carboxylic acid, depending on the conditions.

**Reduction:** The gain of electron(s) leading to a decrease in oxidation number.

**Reflux:** The continual boiling and condensing of a reaction mixture. This technique is often used to make sure a volatile liquid reaches a high enough temperature to ensure that the reaction goes to completion.

**Secondary alcohol:** An alcohol in which the -OH is attached to a secondary carbon atom (i.e.  $\text{R}_2\text{CHOH}$ ). Secondary alcohols can be oxidised under reflux with  $\text{Cr}_2\text{O}_7^{2-}/\text{H}^+$  to form a ketone.

**Substitution:** A reaction in which one atom/group of atoms replaces another.

**Tertiary alcohol:** An alcohol in which the -OH is attached to a tertiary carbon atom (i.e.  $\text{R}_3\text{COH}$ ). Tertiary alcohols cannot be oxidised.

