MIND MAP

Properties and versatile nature of carbon

- Always forms covalent bonds
- Tetravalent
- Tetrahedral
- 3 allotropes – diamond, graphite and fullerenes
- Catenation – Unique property of self-linking of carbon atoms

Ethanol

- Colourless, distinct smell and burning taste, soluble in water in all proportions, neutral to litmus
- Reaction with sodium

  $2CH_3CH_2OH + Na \rightarrow CH_3CH_2ONa + H_2$
- Reaction with concentrated H_2SO_4

  $CH_3–CH_2–OH \xrightarrow[H_2SO_4]{\text{Conc.}} H_2C=CH_2 + H_2O$
- Combustion

  $C_2H_5OH + 3O_2 \rightarrow 2CO_2 + 2H_2O + \text{Heat}$

Ethanoic Acid

- Colourless, pungent smelling liquid, soluble in water in all proportions
- Reaction with sodium carbonate

  $2CH_3COOH + Na_2CO_3 \rightarrow 2CH_3COONa + CO_2 + H_2O$
- Reaction with sodium hydrogen carbonate

  $CH_3COOH + NaHCO_3 \rightarrow CH_3COONa + CO_2 + H_2O$
- Esterification

  $CH_3–\overset{O}{\overset{\|}{C}}–OH + H–OCH_2–CH_3 \xrightarrow[\Delta]{\text{Conc. } H_2SO_4} CH$
- Hydrolysis $CH_3COOC_2H_5 \xrightarrow{NaOH}$

  $C_2H_8OH + CH_3COOH$

Chemical properties of Carbon compounds

Combustion: Burning of carbon compound in air

Substitution: Replacement of an atom or a group of atoms in a organic molecule by another atoms or group of atoms

Addition: Addition of two reactants to form a single product

Oxidation: Addition of oxygen

Soaps

- Sodium salts (or potassium salts) of the long chain carboxylic acids. The ionic group in soaps is $–COO^-Na^+$.
- Not suitable for washing purposes when water is hard.

Detergents

- Sodium salts of long chain benzene sulphonic acids. The ionic group in a detergent is $-SO_3^-Na^+$ or $-SO_4^-Na^+$.
- Can be used for washing even when the water is hard.

Name of compounds	IUPAC Name
Alkene	Alkane – ane + ene = Alkene
Alkyne	Alkane – ane + yne = Alkyne
Haloalkanes	Halo + alkane = Haloalkane
Alcohols	Alkane – e + ol = Alkanol
Aldehydes	Alkane – e + al = Alkanal
Ketone	Alkane – e + one = Alkanone
Carboxylic acid	Alkane – e + oic acid = Alkanoic acid