CAIE IGCSE Chemistry

11.4 Alkanes

Notes

State that the bonding in alkanes is…

- All the bonds in alkanes are single covalent bonds
- Alkanes are saturated hydrocarbons, meaning they only consist of single bonds and have only hydrogen and carbon atoms.
    - Each carbon atom forms four covalent bonds.
    - Contain C-C and C-H covalent bonds.

Describe the properties of alkanes…

- Alkanes are generally unreactive, except combustion (burning) reactions and substitution by chlorine

(Extended only) State that a substitution reaction is…

- A substitution reaction is when one atom or a group of atoms is replaced by another atom or group of atoms.

(Extended only) Describe the substitution reaction of alkanes with chlorine as a photochemical reaction, with ultraviolet light providing the activation energy, Ea , and draw the structural or displayed formulae of the products, limited to monosubstitution

- Alkanes undergo substitution reactions with chlorine
- This is known as a photochemical reaction since UV (ultraviolet) light is needed to provide the activation energy for the reaction to occur
- The general equation for the substitution reaction between an alkane and chlorine is:
  Alkane + Chlorine -> Chloroalkane + Hydrogen chloride
- E.g. Ethane + Chlorine -> Chloroethane + Hydrogen chloride
  $CH_3CH_3 + Cl_2 \rightarrow CH_3CH_2Cl + HCl$