Definitions

Homologous series	A series of organc compounds having the same functional group and each successive member differs by CH2
Molecular formula	Actual number of atom of each element in a molecule. Doesn't show the structure of a molecule
Empirical formula	The simplest whole-number ratio of atoms of each element in a compound
Displayed formula	Shows the relative positioning of the atoms and the bonds between them
Structural formula	Shows the arrangement of atoms in a molecule using the smallest amount of detail
Skeletal formula	Simplified organic formula- only showing functional groups and carbon skeleton
Structural isomers	Compounds with the same molecular formula and a different structural formula
Radical	An atom/group of atoms with an unpaired electron
Homolytic fission	When a covalent bond breaks and each of the bonded atoms takes one of the shared pair of electrons
Heterolytic fission	When a covalent bond breaks and one of the bonded atoms takes both of the electrons in the bond
Curly arrows (in a reaction mechanism)	Used to show the movement of electron pairs

Definitions (cont)

Electr-ophile	A molecule that contains a partially positive atom or a positive ion

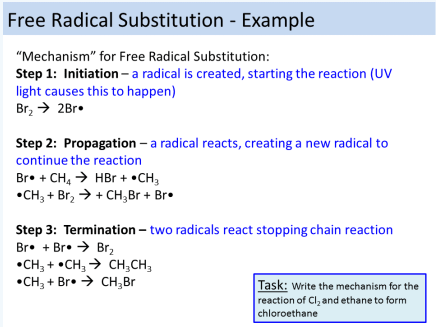
Nomenclature of organic compounds

Identify the longest, continuous carbon chain containing a functional group. This forms the second part of the name of the compound

Identify any side chains attached called alkyl groups. The alkyl group is added as a prefix to the name of the parent chain

You need to number the carbon chain so that the side chain(s) is on the carbon atom with the lowest number. This number goes in front of the alkyl group

Radical substitution



Alkanes

Alkanes are a homologous series made up of saturated hydrocarbons

Each carbon atom is bonded to 4 other atoms by sigma bonds (single covalent bonds)

Each bond angle around a single carbon atom is approximately 109.5 degrees

The sigma bonds are rotational

Properties of alkanes

As the length of the carbon chain increases, the boiling point increases as well. This is because as the chain length increases, there are stronger London forces.

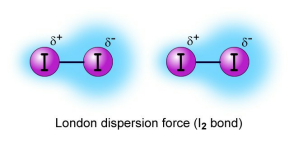
As the chain length increases, the surface area increases therefore more points of contact between molecules. This increases London forces.

Branching decreases boiling point. This is because there are fewer points of contact between the molecules and weaker London forces

Boiling point trend of alkanes

Methane	-162
Ethane	-89
Propane	-42
Butane	-1
Pentane	36
Hexane	69

London Forces



London dispersion force (I_2 bond)

Chemical reactions of the alkanes

Complete combustion of alkanes: alkanes burn completely in sufficient supply of oxygen to produce carbon dioxide and water

Incomplete combustion of alkanes: alkanes burn in a limited supply of oxygen to produce water and carbin monoxide

Alkanes reacting with halogens: occurs in the presence of UV light

Alkenes