

Unit F322: Chains, Energy and Resources

Definitions to Learn

7. Basic Concepts

Molecular formula	actual number of atoms of each element in a molecule
Empirical formula	simplest whole number ratio of the atoms of each element in a molecule
Homologous series	series of organic compounds having the same functional group with successive members differing by CH₂
Functional group	group of atoms responsible for the characteristic reactions of a compound
Structural isomers	same molecular formula, different structures

8. Alkanes

Hydrocarbon	a compound that contains hydrogen and carbon <u>only</u>
Saturated	contains only single C-C bonds
Radical	contains an unpaired electron
Fractional distillation	separates due to differences in boiling point
Fraction	mixture of compounds of similar boiling point
Cracking	breaking a long chain alkane into a shorter chain alkane and an alkene
Biofuel	a fuel produced from plant or animal waste

9-11. Alkenes, Alcohols and Halogenoalkanes

Stereoisomers	same structural formula but different arrangement in space
E/Z isomers	isomers resulting from restricted rotation about a double bond, where two different groups are attached to each carbon of the C=C
Cis/trans isomers	a special case of E/Z isomerism in which two of the substituent groups are the same
Unsaturated	contains one or more double C=C bonds
Electrophile	electron pair acceptor
Nucleophile	lone pair donor
Reflux	continuously boil and condense

12. Enthalpy Changes

Standard conditions	Temperature 298K, pressure 100 kPa (indicated by Δ symbol)
Enthalpy change of reaction, ΔH_r	Enthalpy change when the reaction occurs in the molar quantities shown in the chemical equation
Enthalpy change of formation, ΔH_f	Enthalpy change when one mole of a compound is formed from its elements
Enthalpy change of combustion, ΔH_c	Enthalpy change when one mole of a substance is completely burnt
Hess's Law	Total enthalpy change is independent of route
Average bond enthalpy	Energy needed to break one mole of gaseous bonds

13. Rates & Equilibrium

Activation energy	Minimum energy needed for a reaction to occur
Catalyst	Speeds up a reaction without being used up
Le Chatelier's Principle	The position of equilibrium will shift so as to minimise the effect of any change in conditions
Dynamic equilibrium	Rates of forward and backward reactions are equal Concentrations are constant