



Edexcel IGCSE Chemistry

Topic 4: Organic chemistry

Introduction

Notes





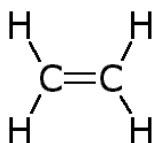
4.1 know that a hydrocarbon is a compound of hydrogen and carbon only

- Hydrocarbon = compound of hydrogen and carbon ONLY

4.2 understand how to represent organic molecules using empirical formulae, molecular formulae, general formulae, structural formulae and displayed formulae

- Empirical formula = simplest whole number ratio of each element in a compound (e.g. for ethene = CH_2)
- Molecular formulae = actual numbers of each element in a compound (e.g. for ethene = C_2H_4)
- General formulae = a type of empirical formula that represents the composition of any member of an entire class of compounds (e.g. for ethene = C_nH_{2n})
- Structural formulae = formula which shows the arrangement of atoms in the molecule of a compound (e.g. for ethene = CH_2CH_2)
- Displayed formulae = shows the symbols for each atom in a compound, with straight lines representing covalent bonds

E.g. for ethene...



4.3 know what is meant by the terms homologous series, functional group and isomerism

- Homologous series = series of compounds with the same general formula and similar properties
- Functional group = a group of atoms responsible for the chemical reactions of a compound
- Isomerism = compounds with the same molecular formula exist in different forms due to different arrangements of atoms (different forms of isomerism exist)

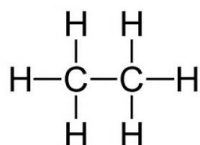


4.4 understand how to name compounds relevant to this specification using the rules of International Union of Pure and Applied Chemistry (IUPAC) nomenclature; students will be expected to name compounds containing up to six carbon atoms

- Prefixes (beginning of the name)
 - Any compound with 1 carbon has the prefix of: Meth-
 - 2 carbons: Eth-
 - 3 carbons: Prop-
 - 4 carbons: But-
 - (Then follow the same rules as shapes in mathematics) 5 carbons: Pent- 6 carbons: Hex-
 - remember the first 4 prefixes using MEPB Monkeys Eat Peanut Butter
- The suffix of any compound refers to the functional group
 - Alkanes – ane (C-C // C-H) e.g. ethane
 - Alkenes – ene (C=C) e.g. ethene
 - Alcohols – ol (OH) e.g. ethanol
 - Carboxylic acids – anoic acid (-COOH) e.g. ethanoic acid

4.5 understand how to write the possible structural and displayed formulae of an organic molecule given its molecular formula

- use information provided above
- e.g. if given molecular formula C_2H_6 , structural formula would be CH_3CH_3 and displayed formula would be:



4.6 understand how to classify reactions of organic compounds as substitution, addition and combustion; knowledge of reaction mechanisms is not required

- Addition reactions involve only ONE PRODUCT
 - I.e. 2 reactants \rightarrow 1 product
 - I.e. addition of hydrogen to ethene to produce ethane (H_2 is added onto $C=C$ to form $H-C-C-H$)
- Substitution reactions involve TWO PRODUCTS
 - I.e. 2 reactants \rightarrow 2 products
 - I.e. Hydrogen chloride + ethanol \rightarrow chloroethane + water (Cl replaces OH – they switch places)
- Combustion involves the reaction of a fuel with OXYGEN
 - Products are water and carbon dioxide only from hydrocarbons (if combustion is COMPLETE)

