**Vocabulary sheet**

Fuels and the environment

## Topic 1 - Stoichiometry

Avogadro’s constant: The number of particles in 12g of 12C. NA

Chemical reaction: A reaction in which bonds in the reactants are broken and bonds in the products are formed resulting in an energy change between the reacting system and its surroundings.

Compound: Two or more types of atoms chemically bonded together.

Element: A substance that contains only one type of atom.

Excess: The reactant which there is more of than needed to react with all of the limiting reagent.

Formula, empirical: The formula obtained by experiment, showing the simplest whole number ratio of atoms of each element in a particle of the substance.

Formula, structural: Shows the arrangement of atoms and bonds within a molecule.

## Topic 11 and 20 – Organic Chemistry

Alcohol, primary: With two hydrogen atoms on the neighboring carbon atom (next to the hydroxyl group). Can be oxidized to aldehydes (by loss of hydrogens) and then to carboxylic acids (by gain of oxygen). Ethanol can be oxidized to ethanal by the orange Cr2O72- ion, which itself becomes reduced to the green Cr3+ ion.

Alcohol, secondary: With one hydrogen atoms on the neighboring carbon atom. Can be oxidized to ketones (by loss of hydrogens).

Alcohol, tertiary: With no hydrogen atoms attached to the neighboring carbon atom. Cannot be oxidized further.

Benzene: Hexagonal shape with delocalized π bonds. Undergo substitution rather than addition reactions.

Boiling and melting point: Depend on intermolecular forces. The greater the intermol. forces, the higher the m.p. and b.p.

Carbon: Group 4 element which always forms 4 covalent bonds, as it has 4 e- in its valence shell.

Func. gr., alcohol: -OH. IUPAC: -anol.

Func. gr., aldehyde: -CHO. IUPAC: -anal.

Func. gr., alkane: No functional group. IUPAC: -ane.

Func. gr., alkene: C=C. IUPAC: -ene.

Func. gr., ketone: -CO-. IUPAC: -anone.

Homologous series: A group of compounds that can be described by a general formula. Have similar chemical properties, but gradually changing physical properties. When all other factors remain constant, increased molar mass means increased intermolecular forces. Often, long carbon chains can negate the effect of a polar end → molecule is non-polar.

Hydrocarbon: Compounds containing only carbon and hydrogen.

Saturated: Containing only single bonds. Alkanes are saturated.

Unsaturated: Containing double bonds. Alkenes are unsaturated. Can be tested for by bromination.