

Section 1.1: Fundamental Ideas in Chemistry

Atoms and Elements

- That everything is made up of tiny particles called atoms.
 - The structure of the atom, including the arrangement of protons, neutrons and electrons.
 - The relative charges of protons (+1), neutrons (0) and electrons (-1).
 - That atoms are neutral (have no overall charge) as they have equal numbers of protons and electrons.
 - That an element is a substance made up of only one type of atom.
 - That atoms of an element have the same number of protons.
 - That atoms of different elements have different numbers of protons.
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The Periodic Table

- That elements can be represented by symbols, e.g. C for carbon, Na for sodium, O for oxygen.
 - That the periodic table contains all the known elements.
 - Where the metals and non-metals are found in the periodic table.
 - How to use the periodic table to find the atomic number and mass number of an element.
 - What atomic number and mass number tell you about an element.
 - How to work out the number of protons, neutrons and electrons in an element from its atomic number and mass number.
 - That elements in a group of the periodic table have the same number of electrons in their outer shells and that this gives them similar chemical properties.
 - That elements in Group 0 of the periodic table are called the noble gases.
 - That the noble gases don't react with other elements because they have a full outer shell of electrons.
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Electron Shells

- How to work out the electronic structure of the first 20 elements of the periodic table.
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Compounds

- That a compound is formed when atoms of different elements react together and form chemical bonds.
 - That when metals react with non-metals, the metal atoms give up electrons and form positively charged ions and the non-metal atoms gain electrons to become negatively charged ions.
 - That oppositely charged ions are attracted to each other and that this attraction is known as ionic bonding.
 - That when non-metals react together their atoms share pairs of electrons. These shared electrons hold the atoms together in a molecule. This is called covalent bonding.
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Equations

- That word equations and symbol equations are used to show the reactants and products of a chemical reaction.
- How to write word equations for reactions.
- That the mass of the products of a reaction is equal to the mass of the reactants, because no atoms are gained or lost during a chemical reaction.
- How to work out the mass of a certain reactant or product when you're given the masses of the other substances involved in the reaction.
- That a symbol equation gives you information about the number of atoms of each element involved in a reaction.
- H How to balance symbol equations.