

TOPIC 2 ATOMIC STRUCTURE

Summary

- The periodic table:
 - elements in the periodic table are arranged in order of increasing atomic number;
 - the periodic table can be used to determine whether an element is a metal or non-metal;
 - groups are columns in the periodic table containing elements with the same number of outer electrons, indicated by the group number;
 - elements within a group share the same valency and have similar chemical properties because they have the same number of electrons in their outer energy levels;
 - the electron arrangement of the first twenty elements can be written.
- Atoms:
 - an atom has a nucleus, containing protons and neutrons, and electrons that orbit the nucleus;
 - protons have a charge of one-positive, neutrons are neutral and electrons have a charge of one-negative;
 - protons and neutrons have an approximate mass of one atomic mass unit and electrons, in comparison, have virtually no mass;
 - the number of protons in an atom is given by the atomic number;
 - in a neutral atom the number of electrons is equal to the number of protons;
 - the mass number of an atom is equal to the number of protons added to the number of neutrons.
- Isotopes:
 - isotopes are defined as atoms with the same atomic number but different mass numbers, or as atoms with the same number of protons but different numbers of neutrons;
 - nuclide notation is used to show the atomic number, mass number (and charge) of atoms (ions) from which the number of protons, electrons and neutrons can be determined;
 - most elements have two or more isotopes;
 - the average atomic mass has been calculated for each element using the mass and proportion of each isotope present. These values are known as relative atomic masses.