

Chemistry 1- 65111

Lecture 1

Periodic table, atoms and reactions of ionic compounds

Atoms are made up of 3 subatomic particles:

- **Protons** (comprise nucleus) (**positive** charge)
- **Neutrons** (comprise nucleus) (**neutral** charge)
- **Electrons** (orbit around nucleus) (**negative** charge)

The diameter of an atom 10^{-10}m with diameter of the nucleus 10^{-14}m
electrons float/orbit around the nucleus with 99% of atom being empty space

protons and neutrons are of similar masses, but electrons are 1/1800 smaller
the number of protons in an element determine what element it is

- All elements have the same number of protons as they do electrons, **no. protons = no. electrons**
- All the elements known are collected on the periodic table and are represented by an atomic symbol (e.g. H,O,He)
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the periodic table is ordered by increasing atomic number (e.g. an element with atomic number of 4 will have 4 protons and 4 electrons).

It is divided into groups:

- **Metals**
- **Non-metals**
- **Metalloids**
- **Lanthanides**
- **Actinides**

Elements only represent a small portion of chemistry but are the main tool for a chemist

Atoms- particles that make up all substances

Molecules- are atoms that have bonded to each other

When atoms bind with each other, they form molecules such as H_2O that contains 2 hydrogens and 1 oxygen atom bonded to each other.

Some elements exist as molecules e.g. H_2 , O_2 .

Mixtures- are not pure substances and contain a combination of atoms, molecules and compounds.

Compounds

pure substances consisting of atoms of more than one element. They have a fixed composition.

Represented by a chemical formula which represents the **'relative'** number of atoms of each element by subscripts e.g. H_2O (2 Hydrogens), CO_2 (2 oxygen).

Ions

Electrons (sometimes) can be added or removed from an atom to form an ion which has a **charge**