Key words and key concepts of Chemistry year 1

CH1

## **1.1 Formulae and Equations**

Oxidation Number - Number of electrons added or taken away to make the element neutral

Q) Explain how to assign oxidation numbers?

A) Look at the electronegativity of the 2 or more elements bonded together; the element with the larger electronegativity will be the deciding factor on oxidation numbers. The element with the larger electronegativity will have the electrons and therefor a negative oxidation number and the element with a lower electronegativity will have a positive oxidation number and must cancel out the negative number unless it is an ion.

## 1.2 Basic ideas about atoms

<u>Alpha radiation ( $\alpha$ )</u> –  $\alpha$  is 2 protons and 2 neutrons. Beta radiation ( $\beta$ ) –  $\beta$  is either an electron or a positron. <u>Gamma ( $\gamma$ )</u> –  $\gamma$  is a high-energy electromagnetic wave. Half-life – Time taken for an element to decay to half its original mats Shell – Group of electrons in the same energy level. Shells are numbered 1, 2, 3, etc. These numbers are known as principal quotam numbers. <u>Atomic orbitals</u> – Regions in the shell wire chore is a high probability of finding an electron. Orbitals have d forent shapes, S orbital has a sphere shape and the P orbital fine a dumbbell shape.

<u>Sub Shell</u> Ornitals of the same shape, grouped together.

Ionization Energy (I.F.) - or four of energy needed to remove 1 mole of electrons from 1 mole of an element.

Effective nuclear charge - Greater the positive charge of the nucleus, greater the attraction on the outermost electron.

Electron Screening – The inner shells screen the outer electrons, from the effective nuclear charge, making the attraction less of the outer electron less.

0) Explain the properties of  $\alpha$ ,  $\beta$  and  $\gamma$  radiation.

A)  $\alpha$  can not penetrate paper, highly ionizing and is positively charged so it is attracted to the far end of a negatively charged electromagnetic plate, because it is heavy and therefor its velocity is not easily changed. Travels 5% the speed of light, so slowly compared to  $\beta$  and  $\gamma$ .  $\beta$  can not penetrate aluminum, ionizing and is negatively charged so it is attracted to the closest part of the positively charged part of the electromagnetic plate because it is light so its velocity is easily changed. Travels at 50% the speed of light. y can not penetrate thick lead, not very ionizing and has no charge. Travels at 100% the speed of light.

Q) Explain the difference of I.E. energies between He and H, He and Li, Be and B, N and O, and He and Ne.