P6.1 - Radioactive Emissions, Atoms and isotopes

The nuclei of atoms of atoms contain protons and neutrons. (The table shows the masses and charges of each *subatomic particle*.) An element is defined by how many rooms it contains. If there are more or less electrons than protons, then it is an *ion*. If there more or less neutrons than the relative atomic mass number indicates, then it is an isotope of that element. Isotopes have different nucleus mass because neutrons have a relative atomic mass of 1.

Key words glossary

subatomic particle - protons, neutrons and electrons. Together, they make up atoms.
ion - charged particles.
isotope - atom with a different number of neutrons but the same amount of protons. For example, carbon-12 has 12 subatomic particles in the nucleus.

Fig. 1

Subatomic particle	Relative Mass	Relative Charge
protons	1.0	+1
neutrons	1.0	0
electron	0.0005 (or 0)	-1

Fig. 2

Radiation	Type	Symbol	What is it?	Equation Symbol
alpha	particle	α	Helium atom nucleus	
beta	particle	β	Fast-moving electron	
gamma	EM wave	γ	EM wave type	none
neutron	particle	n	Particle from the nucleus	

Calculating number of subatomic particles

Protons	Electrons	Neutrons
Atomic number	Relative atomic number	Relative atomic mass - Atomic number

P6.1.1 - Radioactive Emissions, Alpha, Beta, Gamma

Some atoms have unstable nuclei. This causes them to emit radiation. They are then radioactive. (*See Fig.2*)