1.13 - Atoms - The Inside Story

Read p. 38-39 in your textbook and fill in the blanks.

Types of Subatomic Particles

We know that the atom is made of 3 different types of particles called subatomic particles.

Protons are + charged particles located in the nucleus, or core, of the atom. Each proton has a mass of 1 amu.

Neutrons are neutral particles also located in the nucleus. Each neutron has a mass of 1 amu.

Electrons are − charged particles. They have almost NO mass at all - 1/2000 of the mass of a proton or neutron. They move around in the space around the nucleus.

All atoms have the same basic parts, but not all atoms are alike.

Important Numbers and Atoms

The number of protons in the nucleus is called the atomic #. This number determines the type of the atom.

If you know the atomic number, what do you know about the atom?

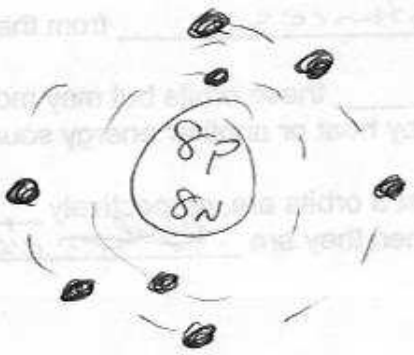
1. # protons
2. # electrons

Each atom must have an equal number of protons and electrons.

For example, if the element oxygen has an atomic number of 8, this tells us that an oxygen atom has 8 protons in the nucleus and 8 electrons moving around the nucleus.

The number of + charges (from the protons) equals the number of − charges (from the electrons), so the overall charge of the atom is Ø.

Draw a diagram of an oxygen atom (use **Figure 1, p. 38** to help you). Add some colour.



The Mass # number represents the sum of the protons and the neutrons in an atom.

If the atomic number = the number of protons,

and, the mass number = the number of protons + neutrons

then how do you calculate the number of neutrons? subtract

Name the internationally recognized system that shows the number of subatomic particles for an atom. standard atomic Notation

This allows anyone to know everything about the atom.

Draw the **standard atomic notation** for chlorine (Cl) below. Label your diagram.

$^{35}_{17}Cl$

Complete the following chart for **boron**. Boron's **atomic number** is 5 and its **mass number** is 11.

standard atomic notation	mass number	atomic number	number of protons	number of electrons	number of neutrons
$^{11}_{5}B$	11	5	5	5	6

The Bohr Model of the Atom

One of the scientists that helped to develop the model of the atom that we use today was a Danish physicist named Niels Bohr.

He suggested that there were limits to the position and motion of electrons. Bohr believed the following...

Electrons move in definite orbits around the nucleus.
(...the same as planets orbiting the sun.)

These orbits are located at certain distances from the nucleus.

Electrons cannot be in between these orbits but may move from one orbit to another (...when excited by heat or another energy source.)

The maximum number of electrons in the first 3 orbits are, respectively 2, 8, 8
Electrons are more ~~excited~~ stable when they are ~~farther~~ closer to the nucleus.

Answer questions 1-3 on p. 39.