Electron theory

MATTER:

Is anything that have a mass and volume.

Mass: the amount of matter in an object.

the more matter there is in an object the more mass it will have.

Categories of matter by molecular activity:

<mark>1, solids</mark>

2, liquids

3, gases

4, plasma

ELEMENTS: cannot be reduced to a simpler form by chemical means. (Basic substance of the matter)

COMPOUNDS: a chemical combination of two or more elements

MOLECULES: the smallest particle of matter that can exist and still retain its identity.

Atoms are composed of three subatomic particles:

1, protons

2, neutrons

3, electrons

ELECTRONS, PROTONS, AND NEUTRONS

Nucleus: is at the center of the atom, which contains the protons and neutrons

Protons: are positively charged particles

Neutrons: are neutrally charged particles.

Electrons: are negatively charged particles.

When the total positive charge of the protons in the nucleus <u>equals</u> the total negative charge of the electrons in orbit around the nucleus, the atom is said to have a neutral charge.

ELECTRON SHELLS AND ENERGY LEVELS

Electrons of an atom will appear only at certain definite energy levels (shells).

The maximum number of electrons in any shell or sub-shell <u>is the same for all atoms</u> and is defined as Electron Capacity = <mark>2n².</mark>

The first shell can only contain two electrons.

The second shell can only contain eight electrons.

The third shell can only contain 18 electrons.

until we reach the seventh shell for the heaviest atoms, which have six energy levels.

Valence: is the number of chemical bonds an atom can form

VALENCE ELECTRONS:

1. can be bond with other atoms

2. it is the electrons in the outermost shell

Ions: Ionization

is the process by which an atom loses or gains electrons.

A) <mark>dislodging</mark> an <mark>electron</mark> from an <mark>atom</mark> will cause the <mark>atom</mark> to <mark>become positively</mark> charged

A,1) the positively charged atom called a positive ion or cation.

B) an atom that has gained an extra number of electrons its negatively charged

B,1) the negative charged atom is called a negative ion or anion.

FREE ELECTRONS:

1, loose electrons in the outer shells

2, Once freed from the atom, the electron can then travel from atom to atom

3, becoming the flow of electrons commonly called current

ELECTRON MOVEMENT

The valence of an atom determines its ability to gain or lose an electron, which ultimately determines the chemical and electrical properties of the atom.

the ability of the material to produce free electrons:

Conductor: A material has a large number of free electrons available, more than 4 free electrons

Semiconductor: Materials falls in between the characteristics of conductors and insulators Insulator: Materials that do not conduct electrical current very well or not at all less than 4 free electrons