

Name: _____

Period: _____

3.2

Oxidation Numbers, Notation, Lewis Dot Diagrams

Oxidation Numbers

The oxidation numbers tell you how many electrons an element will gain or lose. This tells you how it will combine with other elements.

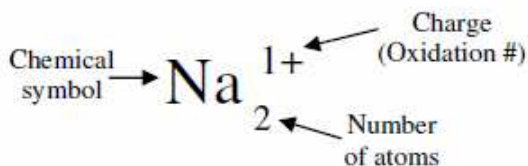
Atoms gain or lose electrons when near certain other elements to fulfill the octet rule: "If I 8 I full".

Full electron levels are more stable. If an atom has 1 or 2 valence electrons it will lose them to have a full inner level. If an atom has 6 or 7 valence electrons, it will gain electrons to fill an electron level.

		Oxidation Numbers													
		1											0		
		1A	2	3	4	-3	-2	-1	18A						
		1	2A	13A	14A	15A	16A	17A	2						
		H	He												
		3	4	5	6	7	8	9	10						
		Li	Be	B	C	N	O	F	Ne						
		11	12	13	14	15	16	17	18						
		Na	Mg	Al	Si	P	S	Cl	Ar						
		19	20	Transition Metals (Oxidation #s vary)				31	32	33	34	35	36		
		K	Ca	Ga	Ge	As	Se	Br	Kr						
		1	2	3	4	-3	-2	-1	0						
		Metals (Positive Ions)			Non-metals (Negative Ions)										
		Positive because they <i>LOSE</i> electrons.			Negative because they <i>GAIN</i> electrons.										

The elements in column 18A (the Noble Gases) have an oxidation # of 0. This means they don't gain or lose electrons, so they don't react or form compounds. They are *INERT*.

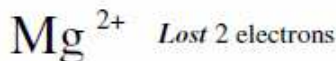
Notation



The above notation tells you that each of the Sodium atoms lost 1 electron. Since there are 2 Sodium atoms, there were 2 electrons lost (1 each). The charge is the oxidation number.

Losers of electrons become positive (a positive ion).

Electrons are negative, so losing negatives makes it more positive.

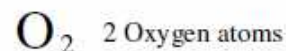


Gainers of electrons become negative (a negative ion).

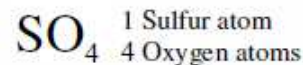
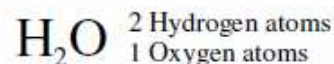
Electrons are negative, so gaining negatives makes it more negative.



Subscripts tell you the number of atoms in a molecule.



No number means 1 atom



Lewis Dot Diagrams

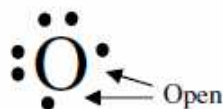
Dot Diagrams (sometimes known as Lewis dot diagrams) are a depiction of an atom's valence electrons. They are a powerful tool in helping you understand, see, and even predict molecular bonding.

The dots represent valence electrons



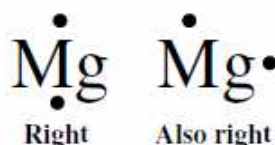
Neon has 8 valence electrons and no openings. Neon has fulfilled the octet rule and will not react with other atoms.

Openings show where electrons can be gained or shared from other atoms.



Oxygen has 6 valence electrons, so it wants 2 more to be full.

Electrons can move around for bonding.



Magnesium has 2 valence electrons. It will lose them to a non-metal and become a positive ion.

X's can be used to keep track of electrons from other atoms.



The x shows that Lithium gives its one valence electron to Chlorine. Chlorine now has 8 and is full.

