

# Bonding & Nomenclature



Ionic & Covalent



Names & Formulas of compounds

## 1. Ionic Bonding

a. What?

*the e<sup>-</sup> in the outer orbital*

i. **Very strong force of attraction** that occurs when a valence e<sup>-</sup> is transferred from a metal to a nonmetal.

b. Why?

i. All atoms want to have the **maximum number of valence e<sup>-</sup>** (usually 8, but 2 for H & He)

1. Called the Octet Rule

c. How?

i. 1<sup>st</sup>, **ions** are formed.

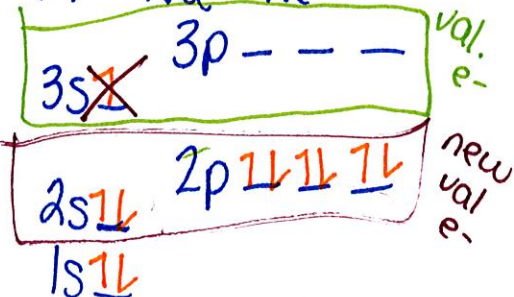
1. Charged atoms

a. **Cation (+ ion)**: formed when metals lose valence e<sup>-</sup>

b. **Anion (- ion)**: formed when nonmetals gain valence e<sup>-</sup>

ii. Examples

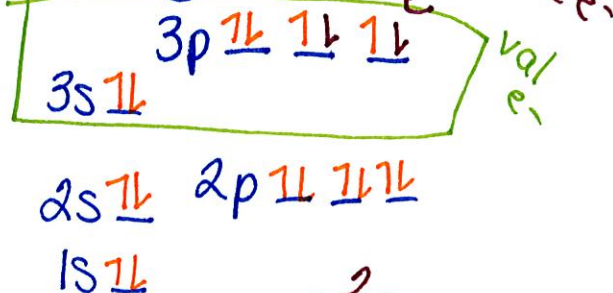
(1) Na - 11e<sup>-</sup>



Na<sup>1+</sup>

metal

(2) S 16e<sup>-</sup>



S<sup>2-</sup>

nonmetal

# Periodic Table of the Elements

Element Name	Atomic Number		Average Mass		Electronegativity	
Hydrogen	1	1.01	1.0	2.1	0.8	0.7
Lithium	3	6.94	1.0	1.5	0.8	0.7
Beryllium	4	9.01	1.5	2.0	1.0	0.9
Sodium	11	22.99	0.9	1.2	0.8	0.7
Magnesium	12	24.31	1.2	1.5	1.0	0.9
Potassium	19	39.10	0.8	1.0	0.8	0.7
Calcium	20	40.08	1.0	1.2	1.0	0.9
Strontium	37	87.62	1.0	1.2	1.0	0.9
Rubidium	37	85.47	0.8	1.0	1.0	0.9
Strontium	38	87.62	1.0	1.2	1.0	0.9
Cesium	55	132.91	0.7	0.9	1.0	0.9
Barium	56	137.33	0.9	1.0	1.0	0.9
Francium	87	(223)	0.7	0.9	1.0	0.9
Radium	88	(226)	0.9	1.0	1.0	0.9
Actinium	89	(227)	1.1	1.3	1.1	1.3
Lanthanum	57	138.91	1.1	1.3	1.1	1.3
Cerium	58	140.12	1.1	1.3	1.1	1.3
Praseodymium	59	140.91	1.1	1.3	1.1	1.3
Neodymium	60	144.24	1.1	1.3	1.1	1.3
Promethium	61	(145)	1.1	1.3	1.1	1.3
Samarium	62	150.36	1.2	1.3	1.2	1.3
Europium	63	151.97	1.1	1.3	1.1	1.3
Gadolinium	64	157.25	1.2	1.3	1.2	1.3
Terbium	65	158.93	1.1	1.3	1.1	1.3
Dysprosium	66	162.50	1.2	1.3	1.2	1.3
Ytterbium	70	173.04	1.1	1.3	1.1	1.3
Luethium	71	174.97	1.1	1.3	1.1	1.3
Lawrencium	103	(262)	1.1	1.3	1.1	1.3
Rutherfordium	104	(261)	1.1	1.3	1.1	1.3
Dubnium	105	(262)	1.1	1.3	1.1	1.3
Seaborgium	106	(266)	1.1	1.3	1.1	1.3
Hassium	108	(269)	1.1	1.3	1.1	1.3
Meitnerium	109	(268)	1.1	1.3	1.1	1.3
Darmstadtium	110	(271)	1.1	1.3	1.1	1.3
Roegenitium	111	(272)	1.1	1.3	1.1	1.3
Copernicium	112	(277)	1.2	1.3	1.2	1.3
Nihonium	113	(284)	1.2	1.3	1.2	1.3
Flerovium	114	(289)	1.8	1.3	1.8	1.3
Uup	115	(288)	1.9	1.3	1.9	1.3
Livermorium	116	(293)	1.9	1.3	1.9	1.3
Uuup	117	(294)	2.0	1.3	2.0	1.3
Uus	118	(294)	2.2	1.3	2.2	1.3
Ununseptium	119	(295)	2.2	1.3	2.2	1.3
Uuo	120	(296)	2.2	1.3	2.2	1.3

Average relative masses are rounded to two decimal places.

All average masses are to be treated as measured quantities, and subject to significant figure rules.

Element Name: Mercury

Symbol: Hg

Atomic Number: 80

Average Mass: 200.59

Electronegativity: 1.9

\*lanthanides

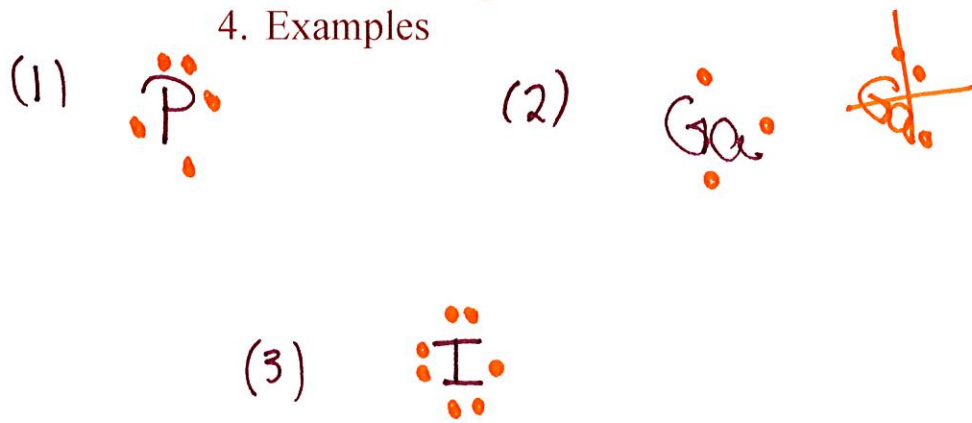
\*\*actinides

Handwritten notes:  $4 \times 10^3$ ,  $2 \times 10^3$ ,  $3 \times 10^3$ ,  $4e$ ,  $5e$ ,  $6e$ ,  $7e$ ,  $8e$ ,  $18$

Handwritten notes:  $1e^-$ ,  $2e^-$

iii. Showing the formation of an ionic bond –  
**Electron Dot Diagrams**

1. Valence  $e^-$  are drawn as dots surrounding the symbol for the element.
2. Maximum of 8  $e^-$  are possible, 2  $e^-$  per side
3. Must place 1 dot on each side of the symbol before adding a 2<sup>nd</sup> dot!
4. Examples



5. Examples showing the transfer of  $e^-$  & forming the bond.

