

## CONCEPT: OCTET RULE

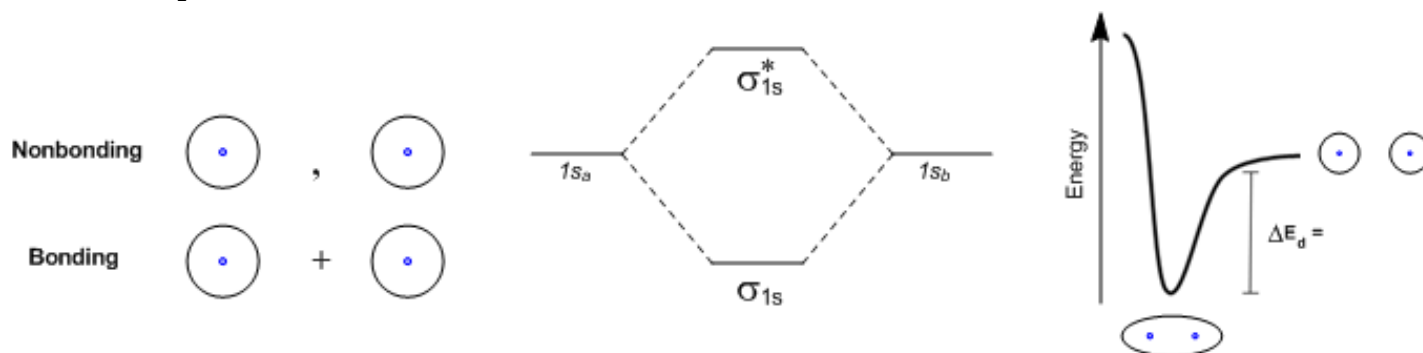
Atoms are most stable when they achieve the number of electrons necessary to reach a **Noble Gas Configuration**.

□ The tendency for atoms to lose or gain electrons in order to reach this configuration is known as the \_\_\_\_\_ rule

		The Organic Table of Elements																					
		1A	2A															3A	4A	5A	6A	7A	8A
Group	Period																						
	1	1 H																					2 He
	2	3 Li	4 Be															5 B	6 C	7 N	8 O	9 F	10 Ne
	3	11 Na	12 Mg															13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
		19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr				
		37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe				
		55 Cs	56 Ba	71 Lu	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn				
		87 Fr	88 Ra	103 Lr	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113	114 Fl	115	116 Lv	117 Uus	118				

We can use MO theory to prove why atoms are most stable (and will not form bonds) in the Noble gas configuration

EXAMPLE: He<sub>2</sub> LCAO



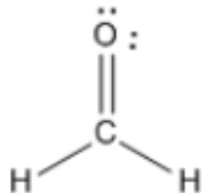
Atoms can satisfy their octet through forming chemical bonds or by possessing lone pairs. These are called **octet electrons**.

- First-row elements (H, He, Li) will prefer to possess \_\_\_\_\_ octet electrons
- Second-row elements (C, N, O, F) will prefer to possess \_\_\_\_\_ octet electrons
  - Atoms smaller than Carbon will possess less than 8 electrons: (Be) \_\_\_\_\_ and (B) \_\_\_\_\_
- Third-row elements may form *expanded octets* that can hold (P) \_\_\_\_\_ and (S) \_\_\_\_\_

**CONCEPT: OCTET RULE**

**PRACTICE:** Analyze the following molecules. Indicate ALL atoms that are in violation of the octet rule.

a)



b)

