

# Everybody wants to be Noble

- Please, please let me have 8 valence electrons!
  - Fine print: or 2, if I'm really close to Helium
- I really, really want my last s and p orbitals to be full
  - OK, just my 1s if I don't have any p's
- I am sworn to follow the Octet Rule
  - With the exception for Helium, of course

# Oxidation Number

+1 +2

+3 -3 -2 -1

1 H 1.00797																	1 H 1.00797	2 He 4.0026					
3 Li 6.939	4 Be 9.0122																	5 B 10.811	6 C 12.0112	7 N 14.0067	8 O 15.9994	9 F 18.9984	10 Ne 20.183
11 Na 22.9898	12 Mg 24.312																	13 Al 26.9815	14 Si 28.086	15 P 30.9738	16 S 32.064	17 Cl 35.453	18 Ar 39.948
19 K 39.102	20 Ca 40.08	21 Sc 44.956	22 Ti 47.90	23 V 50.942	24 Cr 51.996	25 Mn 54.9380	26 Fe 55.847	27 Co 58.9332	28 Ni 58.71	29 Cu 63.54	30 Zn 65.37	31 Ga 69.72	32 Ge 72.59	33 As 74.9216	34 Se 78.96	35 Br 79.909	36 Kr 83.80						
37 Rb 85.47	38 Sr 87.62	39 Y 88.905	40 Zr 91.22	41 Nb 92.906	42 Mo 95.94	43 Tc (99)	44 Ru 101.07	45 Rh 102.905	46 Pd 106.4	47 Ag 107.870	48 Cd 112.40	49 In 114.82	50 Sn 118.69	51 Sb 121.75	52 Te 127.60	53 I 126.904	54 Xe 131.30						
55 Cs 132.905	56 Ba 137.34	*57 La 138.91	72 Hf 178.49	73 Ta 180.948	74 W 183.85	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.09	79 Au 196.967	80 Hg 200.59	81 Tl 204.37	82 Pb 207.19	83 Bi 208.980	84 Po (210)	85 At (210)	86 Rn (222)						
87 Fr (223)	88 Ra (226)	†89 Ac (227)	104 Rf (261)	105 Db (262)	106 Sg (266)	107 Bh (262)	108 Hs (265)	109 Mt (266)	110 ? (271)	111 ? (272)	112 ? (277)												

# Ions

- Cations – positive charge

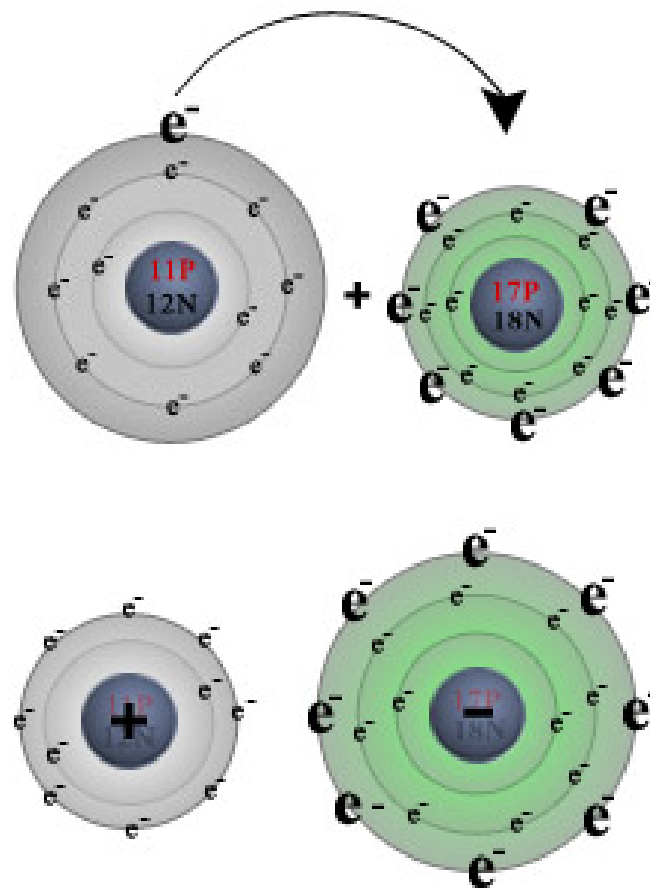
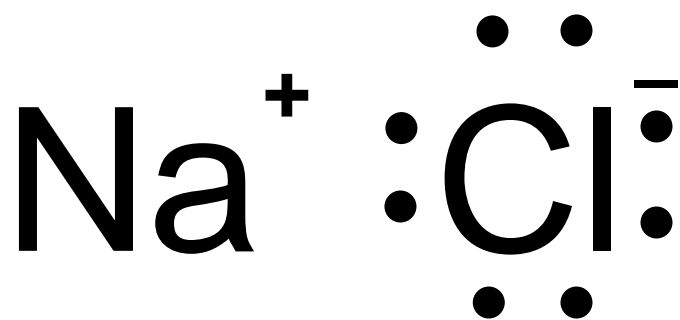
Ca **t** ion = **+**



- Anions – negative charge

A **n** ion = **n**egative

# Ionic Bonding

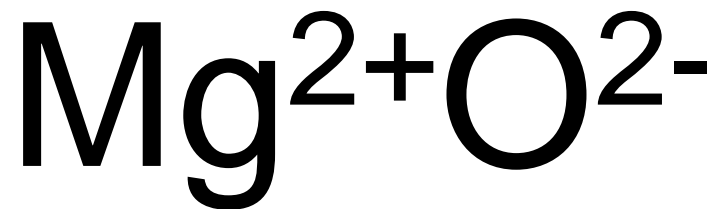


# Ionic Bonding

- The bond is formed through the **transfer of electrons**
- Electrons are transferred **to achieve noble gas configuration**
- Cations and anions are held together by their opposite charges
- Ionic compounds are called **salts**.

# Names

- Start with the cation (metal) name
- Add the first part of the anion (non-metal) name, with “ide” to the end



**Magnesium    Oxide**

# Anion Names

**Nitrogen**

**Nitride**

**Oxygen**

**Oxide**

**Fluorine**

**Fluoride**

**Phosphorus**

**Phosphide**

**Sulfur**

**Sulfide**

**Chlorine**

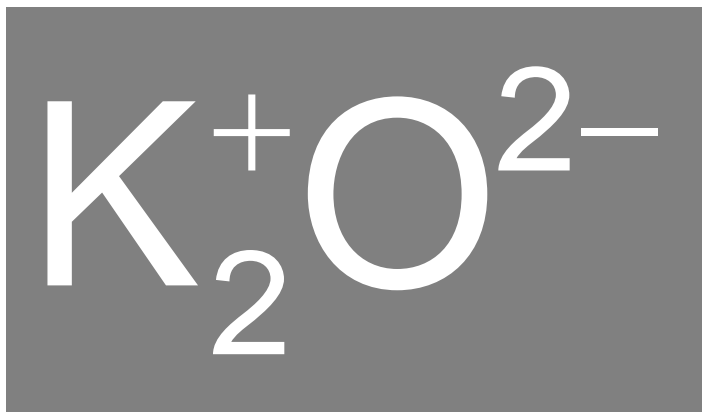
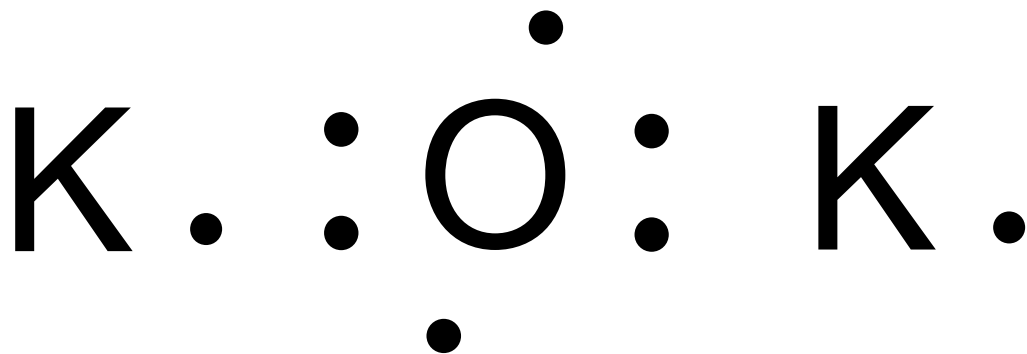
**Chloride**

**Bromine**

**Bromide**

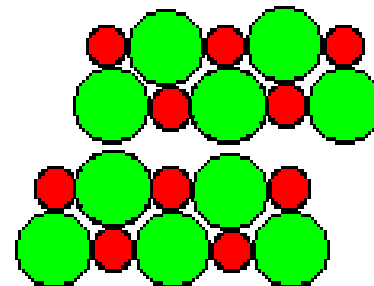
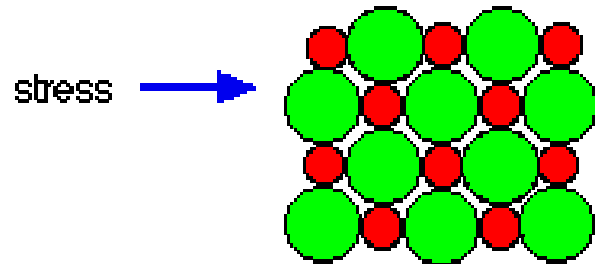
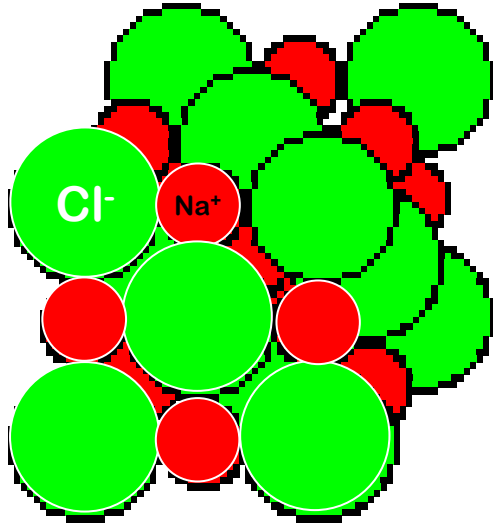
**Iodine**

**Iodide**



**Potassium  
Oxide**





# Ionic Compounds

- Form crystals – a "lattice"
- Hard and brittle
- Very high melting and boiling points
- Conduct electricity when dissolved in water

