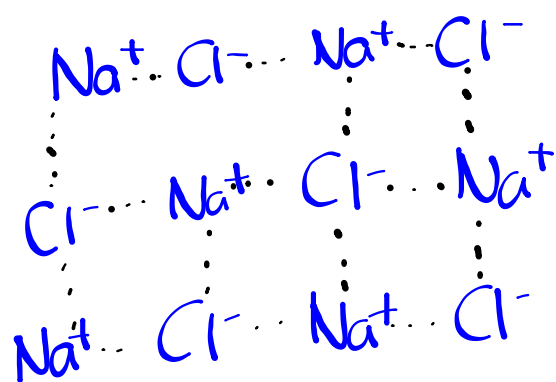
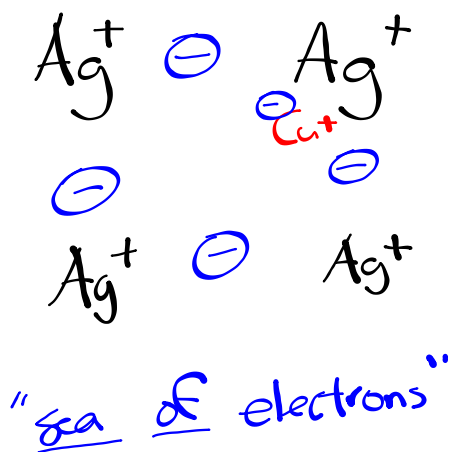


IONIC  
(NaCl)



METALS

Cations



# Alloys

## Alloys

Mixtures of two or more elements, at least one of which is a metal.

### Table 7.3

Name	Composition (by mass)
Sterling silver	Ag 92.5%
	Cu 7.5%
Cast iron	Fe 96%
	C 4%
Stainless steel	Fe 80.6%
	Cr 18.0%
	C 0.4%
	Ni 1.0%
Spring steel	Fe 98.6%
	Cr 1.0%
	C 0.4%
Surgical steel	Fe 67%
	Cr 18%
	Ni 12%
	Mo 3%

*Form in one of two ways:*

### **1) Substitutional Alloys**

If atoms of the alloy are about the same size, they can replace each other in the crystal.

### **2) Interstitial Alloys**

If atomic sizes are quite different, smaller atoms can fit into the spaces between the larger atoms.

## Electronegativity

### Electronegativity

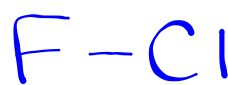
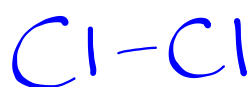
The ability of an atom in a compound to attract electrons



### Trends

- Within a group, electronegativity decreases from top to bottom
- Within a period, electronegativity increases from left to right

Ex. F  $\rightarrow 4.0$



**Table 6.2**

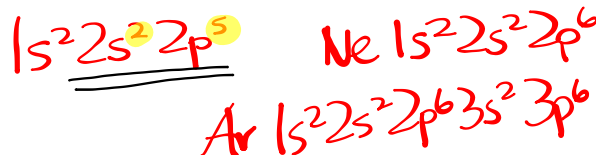
**Electronegativity Values for Selected Elements**

<b>H</b> 2.1						
<b>Li</b> 1.0	<b>Be</b> 1.5	<b>B</b> 2.0	<b>C</b> 2.5	<b>N</b> 3.0	<b>O</b> 3.5	<b>F</b> 4.0
<b>Na</b> 0.9	<b>Mg</b> 1.2	<b>Al</b> 1.5	<b>Si</b> 1.8	<b>P</b> 2.1	<b>S</b> 2.5	<b>Cl</b> 3.0
<b>K</b> 0.8	<b>Ca</b> 1.0	<b>Ga</b> 1.6	<b>Ge</b> 1.8	<b>As</b> 2.0	<b>Se</b> 2.4	<b>Br</b> 2.8
<b>Rb</b> 0.8	<b>Sr</b> 1.0	<b>In</b> 1.7	<b>Sn</b> 1.8	<b>Sb</b> 1.9	<b>Te</b> 2.1	<b>I</b> 2.5
<b>Cs</b> 0.7	<b>Ba</b> 0.9	<b>Tl</b> 1.8	<b>Pb</b> 1.9	<b>Bi</b> 1.9		

# Covalent Bond

Recall that a **covalent bond** is a shared pair of electrons between two nonmetal atoms.

- Electrons are attracted to the positive nuclei
- Each atom wants to reach the electron configuration of a noble gas ( $ns^2np^6$  - Octet Rule)



## Single Covalent Bond

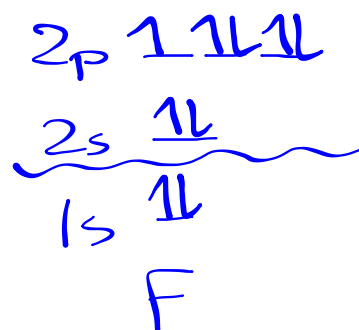
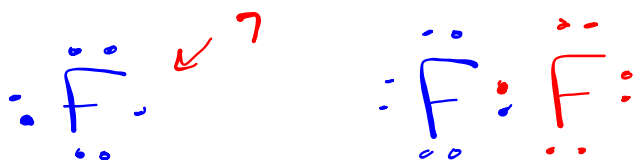
Two atoms held together by sharing a pair of electrons



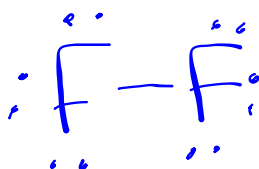
## Molecular Formula



## Electron Dot Structure

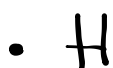
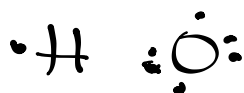


## Structural Formula

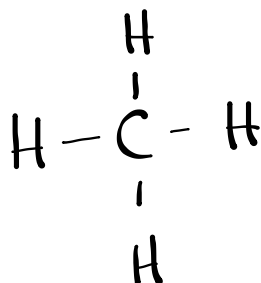
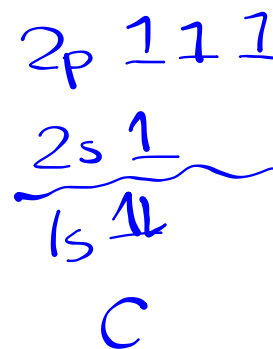
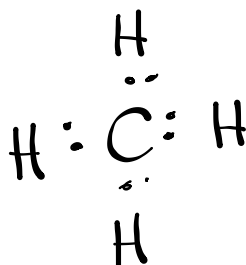
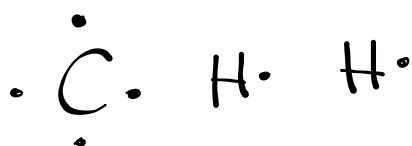


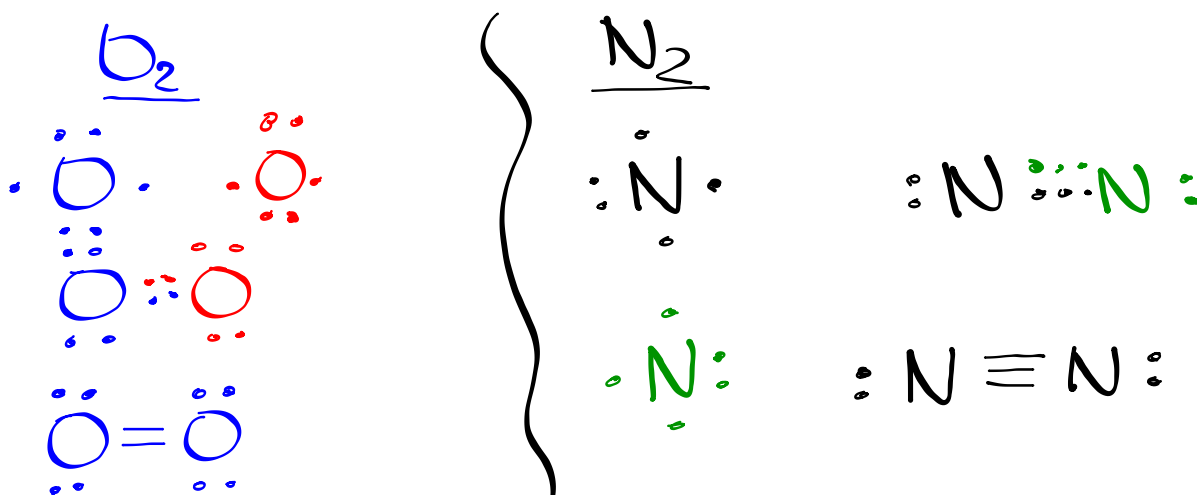
## Lone pair (unshared pair)

A pair of valence electrons not shared between atoms

**H<sub>2</sub>O****CH<sub>4</sub>**

- one of carbon's 2s electrons is promoted to the 2p orbital:



**Double covalent bond**

Two shared pairs of electrons

**Triple covalent bond**  $\text{N}_2$ 

Three shared pairs of electrons





# Homework

**p. 220 #7, 8**

**p. 225 #9-12**