

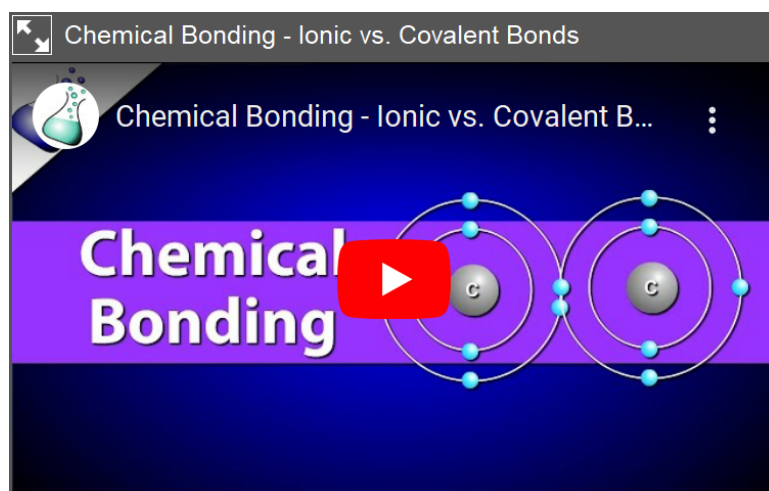
## Ionic vs. Covalent Bonds

Remember - ionic compounds occur between metals and non-metals (or polyatomic ions). This is because one ion easily gives up electrons and the other easily accepts them.

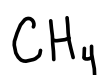
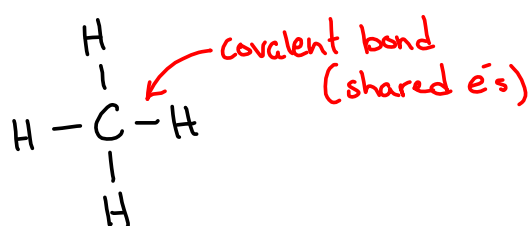
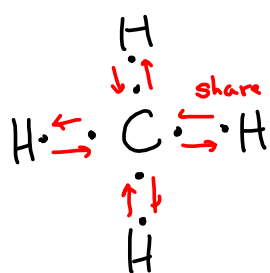
We mentioned carbon, with four valence electrons, doesn't easily form ions, so how does it form compounds?

A **covalent bond** occurs when two atoms *share* valence electrons to fill their shells.

↑      ↑  
shared    outer  
          energy  
          level  
          electrons

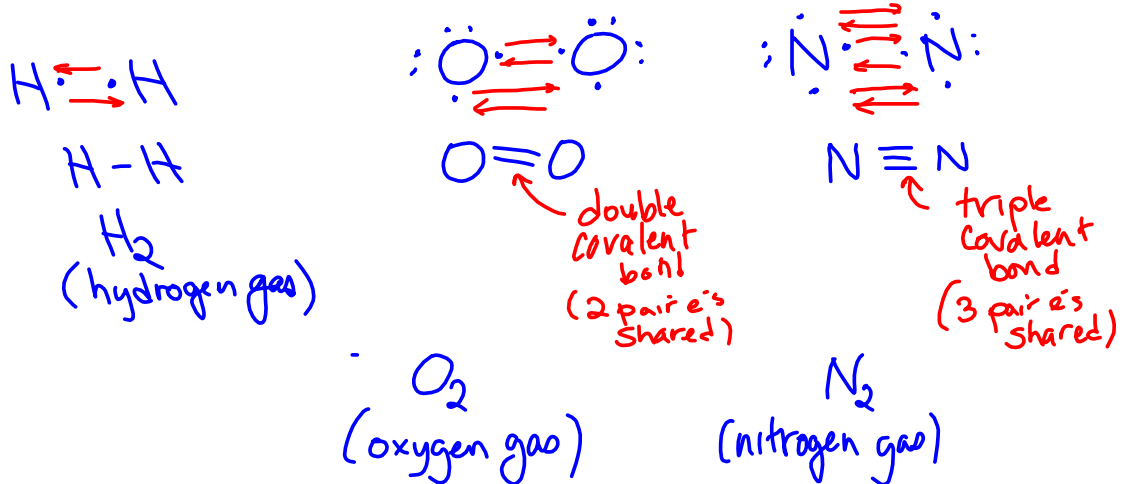
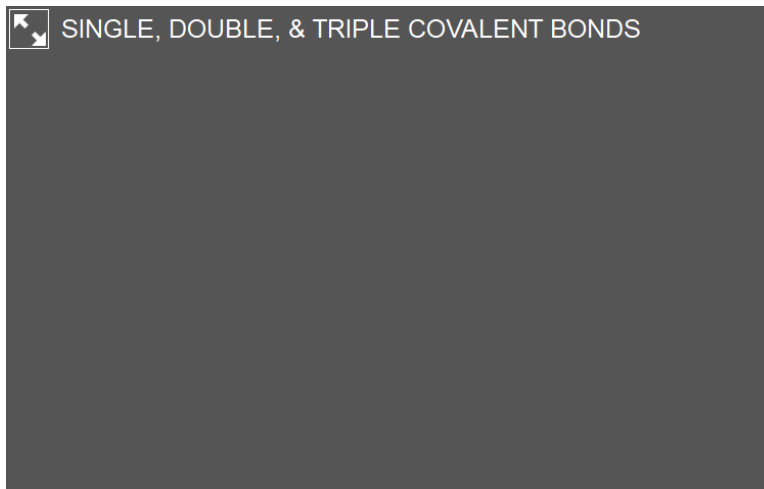


So, if we consider carbon and hydrogen



methane

## Single, Double and Triple Covalent Bonds



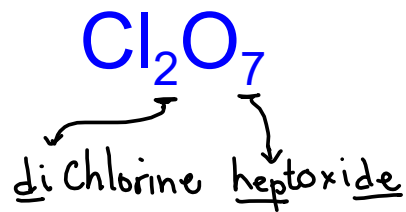
## Naming Binary Molecular Compounds

*2 different elements*

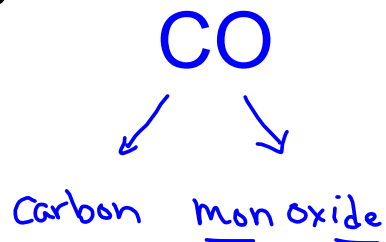
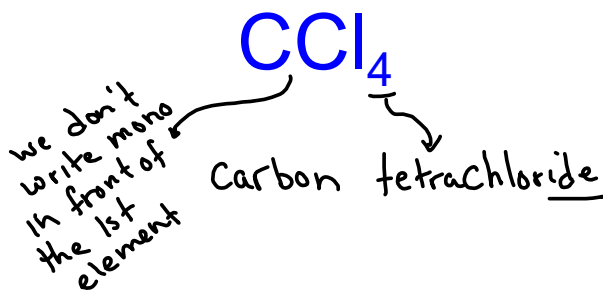
- A binary molecular compound is usually made of two non-metals.
- The naming is similar to ionic compounds
  - > We name the first element and then the second element, changing the ending to -ide.
  - > It's different in that we use prefixes to indicate the numbers of each atom in the molecular formula:

Number of atoms	Prefix
1	mono-*
2	di-
3	tri-
4	tetra-
5	penta-
6	hexa-
7	hepta-
8	octa-
9	nona-
10	deca-

## Examples



drop "a" because oxygen begins with a vowel.



drop the "o" because it begins with a vowel

## Some special compounds

Some compounds are so common that rather than using systemic names, we use their common names:

water -  $H_2O$  - dihydrogen monoxide

ammonia -  $NH_3$  - nitrogen trihydride

methane -  $CH_4$  - carbon tetrahydride

hydrogen peroxide -  $H_2O_2$  - dihydrogen dioxide  
for each

### Some other notes:

1) The order of common nonmetals in binary compound formulas is

C, P, N, H, S, I, Br, Cl, O, F.

*you do not need to memorize this ;)*

2) If the element begins with a vowel, we drop the *a* or *o* from the prefix (e.g. carbon monoxide, not carbon monoxide).

3) We don't add *mono-* to the first element's name if there is only one atom (e.g. carbon dioxide, not monocarbon dioxide).

**Practice:**

Write the formulas of the following compounds:

- a) Dihydrogen monosulfide
- b) Chlorine dioxide
- c) Phosphorus pentiodide

Write the names for the following compounds:

- a)  $S_2Cl_2$
- b)  $NO_2$
- c)  $CBr_4$



