Covalent Bonds

Opener

- You have 10 minutes to complete your homework

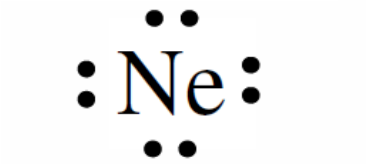
Grade Homework

- Ionic Compounds

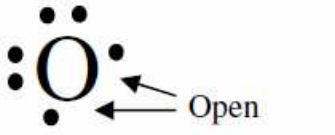
Lewis Dot Diagrams

- Dot Diagrams are a depiction of an atom's valence electrons
- They are a powerful tool in helping you understand, see, and even predict molecular bonding

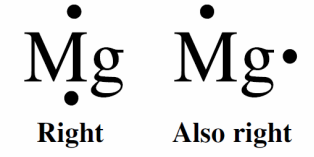
Dots Represent Valence Electrons



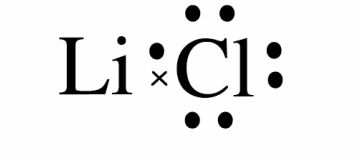
Openings show where electrons can be gained or shared from other atoms



Electrons can move around for bonding



X's can be used to keep track of electrons from other atoms



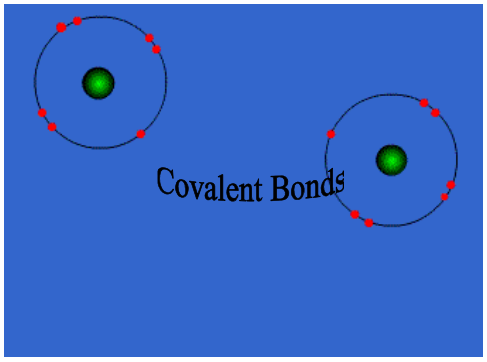
Word/Term: Covalent Bonds	Drawing:
Describe in own words:	
Textbook Definition:	Rate my Understanding: 1 2 3 4
How I remember it:	Reflections:

Use X's for Different Atoms

If you use only dots you won't be able to see where the electrons came from.

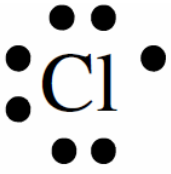
Hard to read

Easy to read

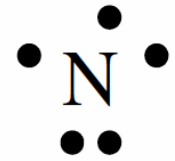


Remember the Dots are Valence Electrons

Chlorine has 7 valence electrons
Chlorine needs 1 more to be full.



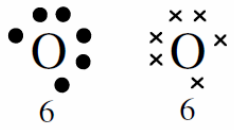
Phosphorus has 5 valence electrons
Phosphorus needs 3 more to be full.



Covalent Bonding

- You must fulfill two criteria when making covalent bonds
  1. The individual atoms must have the proper number of valence electrons
  2. When bonded, each atom must have 8 electrons through sharing

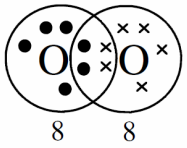
Oxygen Does not Exist as an Individual Atom



Each oxygen has only
6 valence electrons
and needs 2 more.

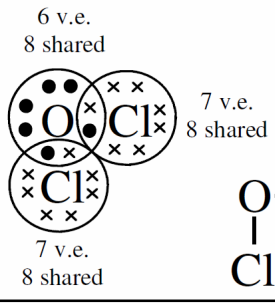
Molecules Made of the Same Type of Atom

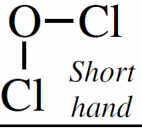
Oxygen is a *diatomic molecule*: it is found as a molecule of 2 atoms.



Together each oxygen has 8 valence electrons thru *sharing*.

Oxygen dichloride: OCl_2





Short hand

Short Hand

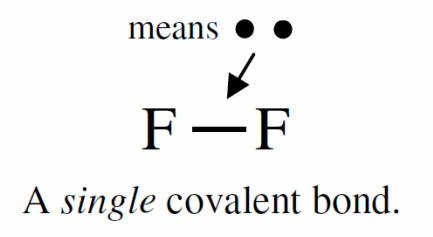
- Though Lewis Dot Diagrams are a powerful tool to determine how elements bond, they take a long time to draw
- Chemists use lines to show bonds

A Covalent Bond

—

Each line means 2 electrons are shared

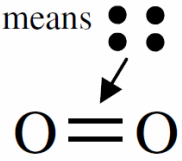
Single Bond-each atom shares 1 electron (2 total)



A *single* covalent bond.

Each Fluorine has 7 v.e. plus 1 for the 1 bond = 8!

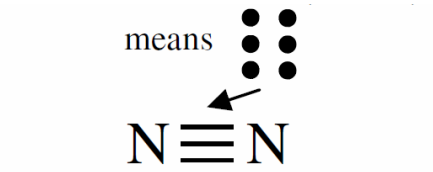
Double Bond-each atom shares 2 electrons (4 total)



A *double* covalent bond.

Each Oxygen has 6 v.e. plus 2 for the 2 bonds = 8!

Triple Bond-each atom shares 3 electrons (6 total)



A *triple* covalent bond.

Each Nitrogen has 5 v.e. plus 3 for the 3 bonds = 8!

Draw the Lewis Dot Diagram for molecular Chlorine (Cl_2).

Short hand

Using Lewis Dot Diagrams to predict how Oxygen and Fluorine will combine.

Short hand

Chemical Bonds Song Cage Match

A B C

Homework

- Covalent Compounds
- Next Class
  - Quiz 9
  - Naming Compounds