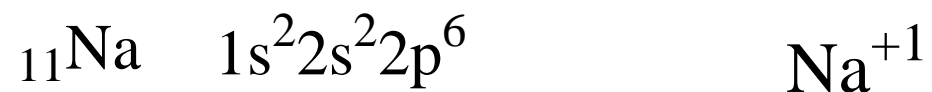
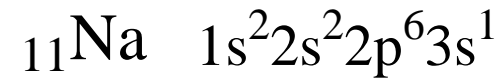


Bonding

How atoms interact to form compounds

Ions

atoms that have lost or gained electrons
become **charged particles** called **ions**



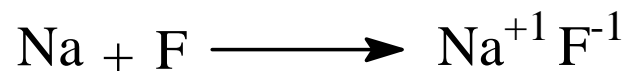
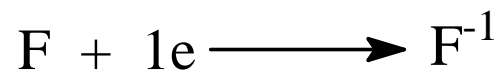
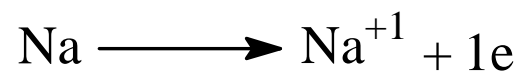
Another Example



**Note: the electron gained by F
could come from Na**

Ionic Bonding

**The transfer of electrons from one atom (a metal)
to another atom (a non-metal)**



How many electrons gained or lost?

The inert gases all have the electron configuration ns^2np^6 .

Problem:

Show how sodium could react with oxygen to form the compound sodium oxide (Na_2O)



Magnesium Fluoride?

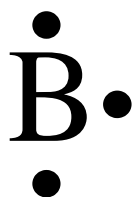
Covalent Bonding- bonding between non-metal atoms

Atoms **share** unpaired valence electrons

Lewis “dot” Structures

Represent valence electrons

${}_{5}\text{B}$
group 3 (therefore 3 valence electrons)



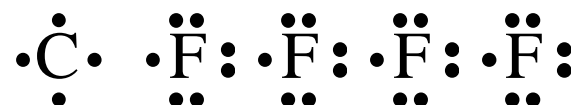
${}_{7}\text{N}$
5 valence electrons
(group 5)

Bonding and Lewis Structures

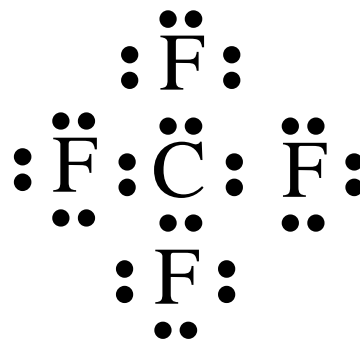
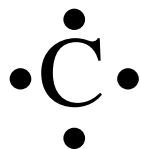


Follow these steps

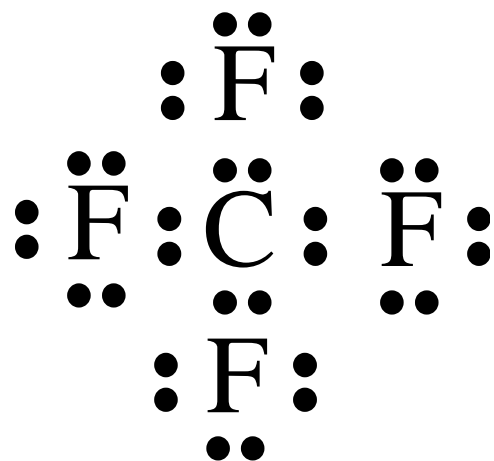
1. Write the Lewis structures for all atoms



2. Find the "central atom"- the one with the **most unpaired electrons**. Connect other atoms with unpaired electrons

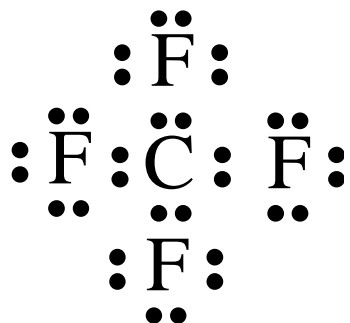


Check for Octets



Finishing Touches

Use lines for covalent bonds



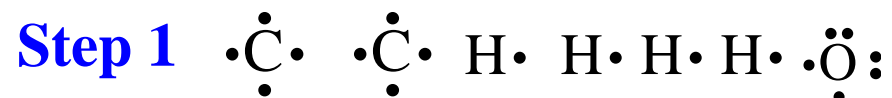
H cannot have an octet!

1st period means 2 electrons fill first energy level

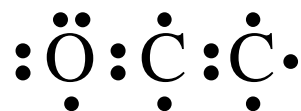
H will look like He in Lewis structures

Do H_2O

More Complex Structures

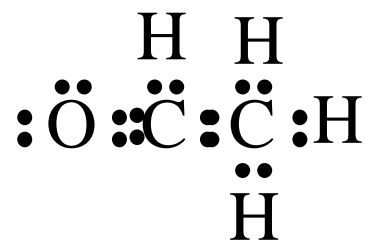


Step 2 Connect the atom with the next most unpaired electrons to the central atom. Continue until only H's are left



Last Step

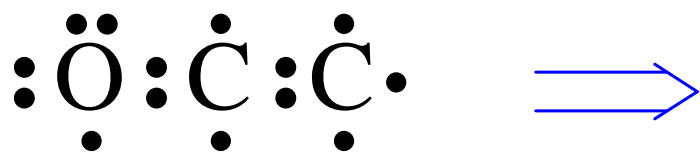
Step 5 Connect H's, draw lines for bonds and include lone pairs



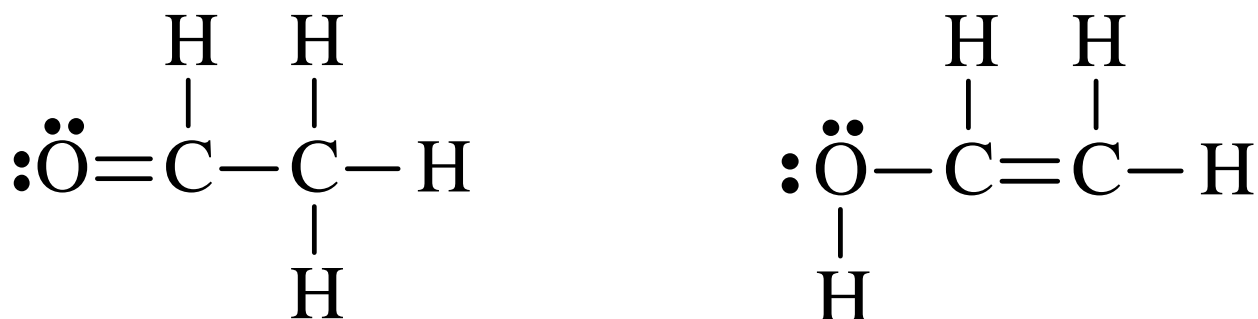
Try These



Isomers- a different way of connecting the same atoms



Compare Structures



All atoms have octets

C forms 4 bonds

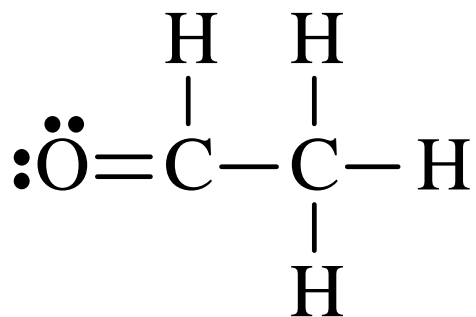
O forms 2 bonds

H forms 1 bond

N forms 3 bonds

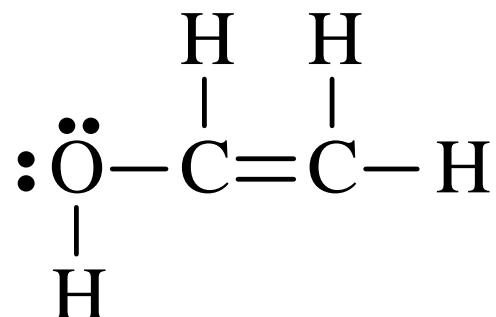
halogens form 1 bond

Differences?



Double bond between C and O

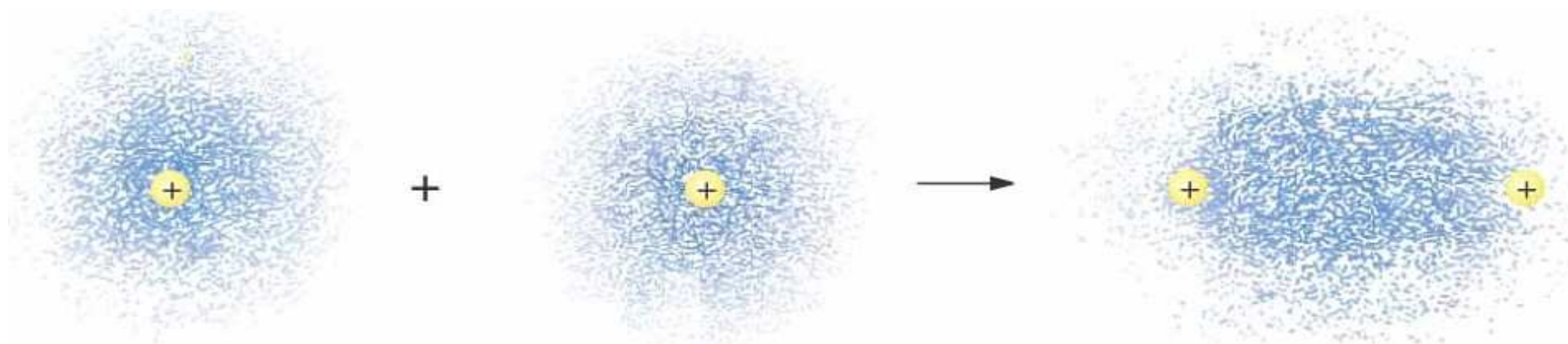
O bonded only to C



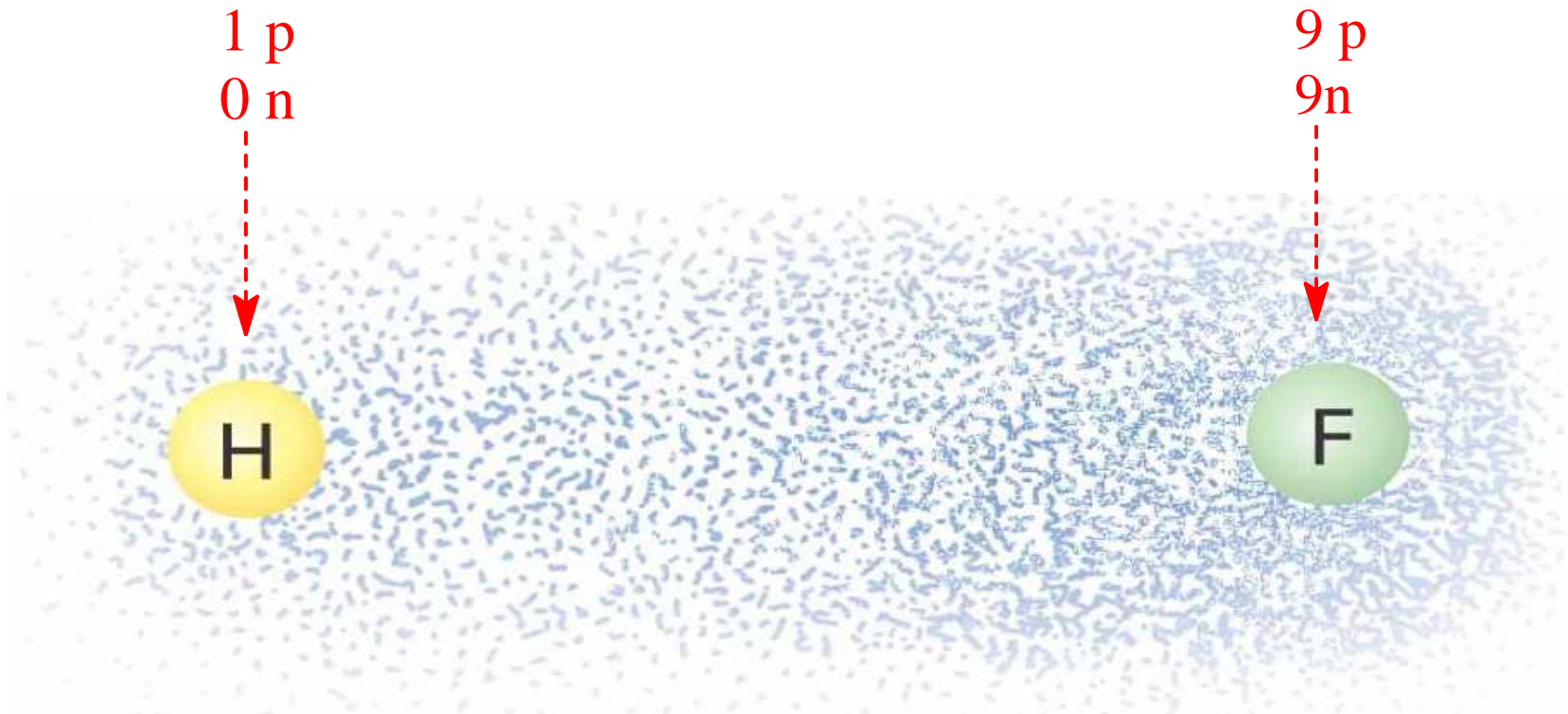
Double bond between C and C

O bonded to H and to C

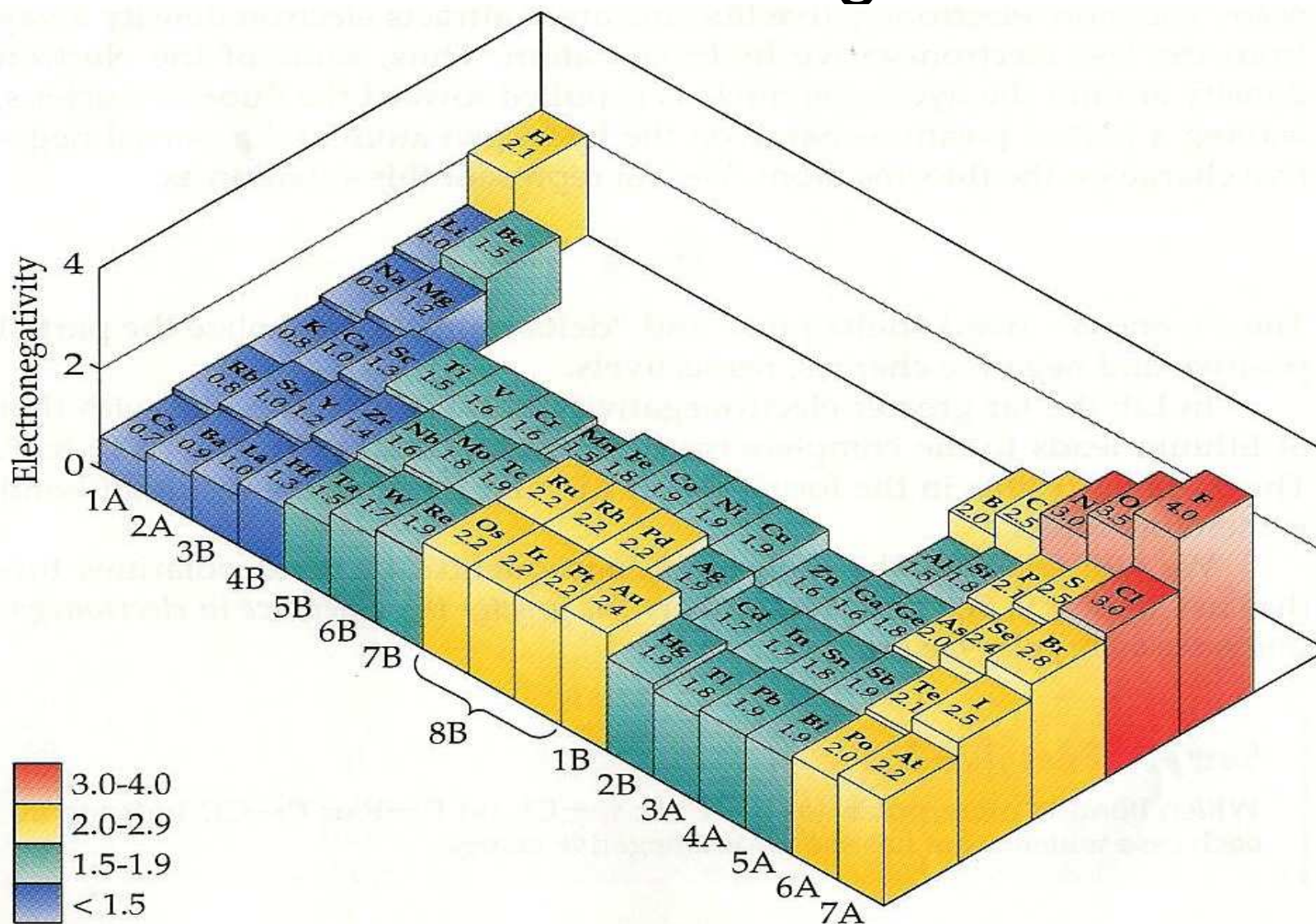
Another Look into Covalent Bonding



Polar Covalent Bond

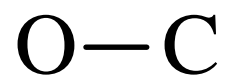


Electronegativity- a measure of nuclear attraction for bonding electrons



Using the Scale

Which bond is more polar?



$$\text{O} = 3.5$$

$$\text{O} = 3.5$$

$$\text{C} = \underline{2.5}$$

$$\text{H} = \underline{2.1}$$

$$1.0$$

$$1.4$$

Indicating the “dipole”

