

CH105 ST
Bliss Chang

Naming Covalent Compounds

H_2O	dihydrogen monoxide	CO_2	carbon dioxide
SiO_4	silicon tetraoxide	XeF_6	xenon hexafluoride
CF_4	carbon tetrafluoride	P_2Cl_3	diphosphorous trichloride

Polyatomic Ions

NH_4^+	ammonium	ClO_4^-	chlorate
NO_3^-	nitrate	HCO_3^-	bicarbonate or hydrogen carbonate
SO_4^{2-}	sulfate	PO_4^{3-}	phosphate

Homo and heteroatomic Molecules

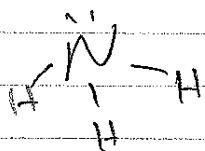
Differentiate between homo- and heteroatomic molecules and provide an example of each.

Homo - same element	H_2, O_2, O_3, F_2
Hetero - different elements	CO_2, H_2O

Electron Dot Structures

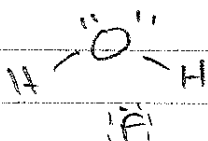
- 1) Place least electronegative atom (except H) as the central atom.
- 2) Count the total number of e^- in the compound.
- 3) Assign single bonds to any atoms that require one pair of e^- to have an octet.
- 4) If there are not enough electrons, start forming multiple bonds.
- 5) Check that all atoms have octets.

NH_3

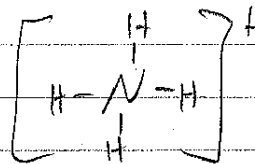


CO_2 $\overset{\cdot\cdot}{O} = C = \overset{\cdot\cdot}{O}$

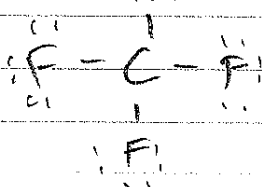
H_2O



NH_4^+



CF_4



N_2

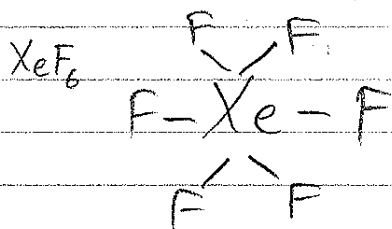
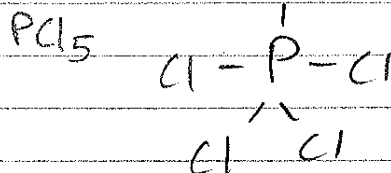
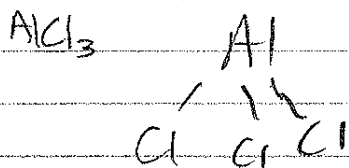
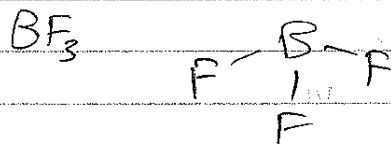
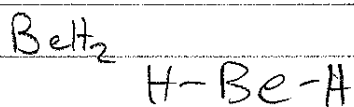


Exceptions to the Octet Rule

B, Al can have $6 e^-$

Be can have $4 e^-$

Any element in the 3rd row or below can expand its octet ($10 e^-$ or greater)



Distinguishing Between Ionic and Covalent Compounds

- Ionic compounds have large electronegativity differences (often a metal + a nonmetal)
- Covalent compounds have small electronegativity differences (often two nonmetals)
- Homoatomic molecules are always covalent.

Identify the following as either ionic or covalent. Indicate bond polarity for covalent compounds.

