

## Bonding and Nomenclature Study Guide

Kelly

Tutoring is available after school Thursday and before school by appointment. You can also go to this website for assistance as well.

<http://misterguch.brinkster.net/ionic.html>

<http://misterguch.brinkster.net/covalentcompounds.html>

<http://misterguch.brinkster.net/lewisstructures.html>

### Type III Covalent Compounds

1. oxygen difluoride



2. sulfur hexafluoride



3. heptane



4.  $\text{SiF}_4$

silicon tetrafluoride

5.  $\text{C}_5\text{H}_{12}$

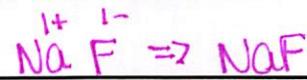
pentane

6.  $\text{NO}_2$

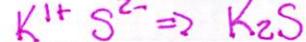
nitrogen dioxide

### Type I Regular Ionic Compounds

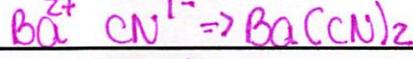
7. sodium fluoride



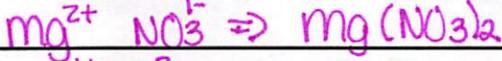
8. potassium sulfide



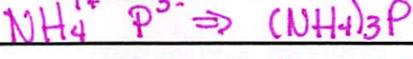
9. barium cyanide



10. magnesium nitrate



11. ammonium phosphide



12. KCl

potassium chloride

13.  $\text{Na}_2\text{O}$

sodium oxide

14.  $\text{RaClO}_2$

radium chlorite

15.  $\text{Na}_2\text{CO}_3$

sodium carbonate

16.  $\text{Cs}_2\text{SO}_4$

cesium sulfate

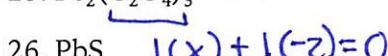
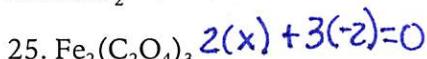
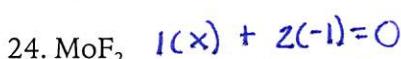
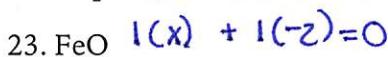
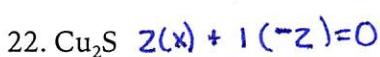
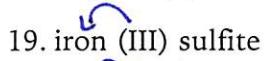
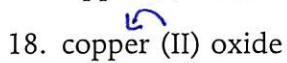
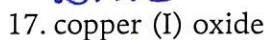
### Type II Transition Metal Ionic Compounds

-These are made of all nonmetals & use prefixes!  
Never criss-cross!

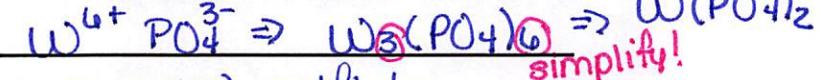
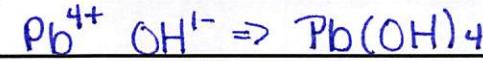
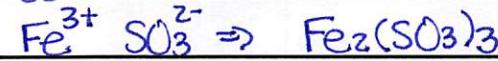
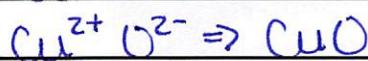
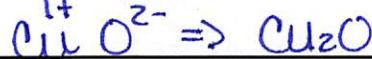
Prefixes
1-mono
2-di
3-tri
4-tetra
5-penta
6-hexa
7-hepta
8-octa
9-nona
10-deca

## Type II - Transition Metals - need Roman numerals in name.

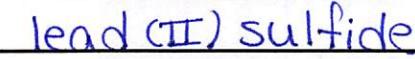
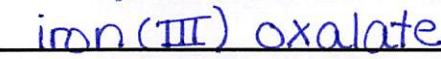
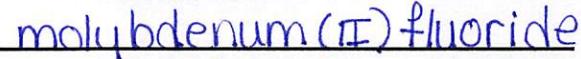
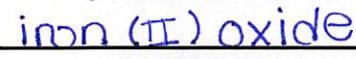
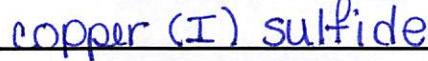
### Ionic



criss-cross charges



simplify!



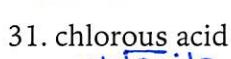
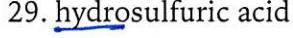
### Acids criss-cross charges



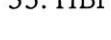
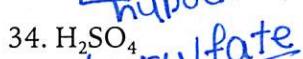
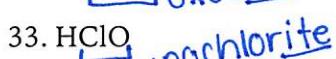
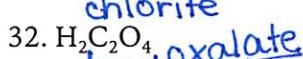
phosphate



carbonate



chlorite

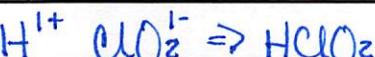
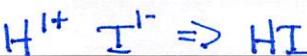
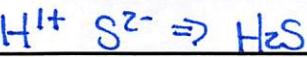
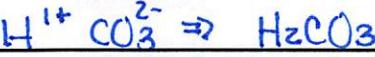
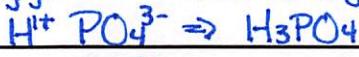


### Binary Acids

yes - hydro-  
no oxygen

### Oxyacids

no hydro-  
yes oxygen



oxalic acid (no hydro b/c there is oxygen)

hypochlorous acid

sulfuric acid

hydrobromic acid (hydro b/c there is no oxygen)

hypophosphoric acid

"If you ate the ic,  
you get the ite ous!"

Hodgepodge: These can be any type.



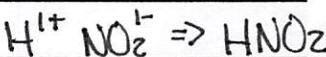
### Type III



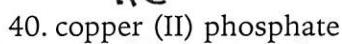
### Type I



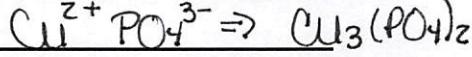
### Oxynitride



ite



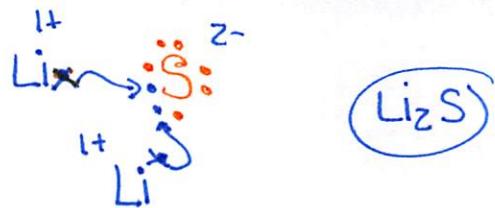
### Type II



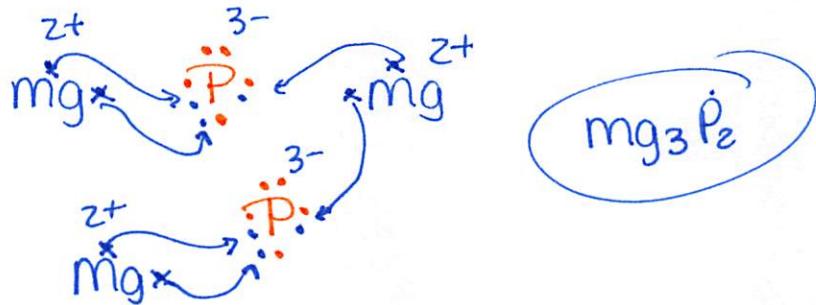
41. disilicon trioxide  
 42. hydrochloric acid  
 43. aluminum iodide  
 44.  $\text{BrF}_3$   
 45.  $\text{Li}_2\text{CO}_3$   
 46.  $\text{Fe}_3(\text{PO}_4)_2 \ 3(x) + 2(-3) = 0$   
 47.  $\text{HNO}_3$ , nitrate  
 48.  $\text{CaF}_2$   
 49. HF  
 50.  $\text{Cu}_2\text{CO}_3 \ 2(x) + 1(-2) = 0$
- Type III  $\text{Si}_2\text{O}_3$   
BA  $\text{H}^{1+} \text{Cl}^{-} \Rightarrow \text{HCl}$   
Type I  $\text{Al}^{3+} \text{I}^{-} \Rightarrow \text{AlI}_3$   
Type III bromine trifluoride  
Type I lithium carbonate  
Type II iron (II) phosphite.  
OA nitric acid  
Type I calcium fluoride  
BA hydrofluoric acid  
Type II copper (I) carbonate

Ionic Bonding: Lewis Structures (Show transfer of electrons and charges formed.)

51. Li and S



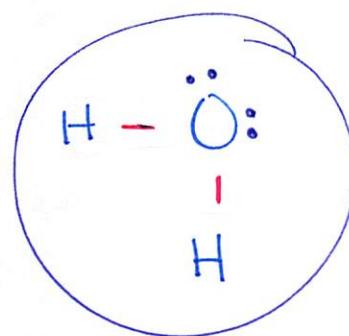
52. Mg and P



Covalent Bonding: Lewis Structures (Show the sharing of electrons.)

$\text{H}_2\text{O}$   
 $2(1e^-) + 1(6e^-) =$   
 $2e^- + 6e^- = \frac{8e^-}{2} =$   
 - 4 prs. available  
 - 2 bonding prs  
 - 2 lone pairs

O-center  
2H-ends



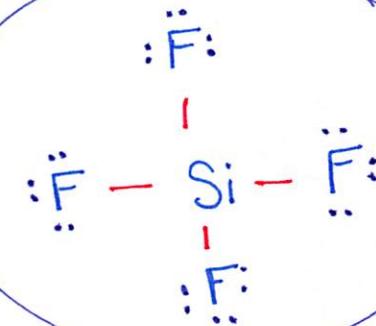
54.  $\text{SiF}_4$

$$1(4e^-) + 4(7e^-) =$$

$$4e^- + 28e^- = \frac{32e^-}{2} =$$

16 prs. available  
- 4 bonding prs  
12 lone prs.

Si-center  
F-ends



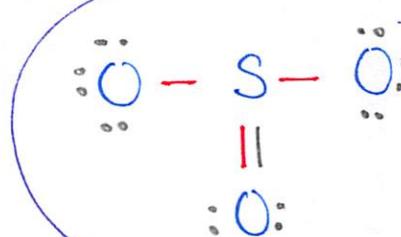
55.  $\text{SO}_3$

$$1(6e^-) + 3(6e^-) =$$

$$6e^- + 18e^- = \frac{24e^-}{2} =$$

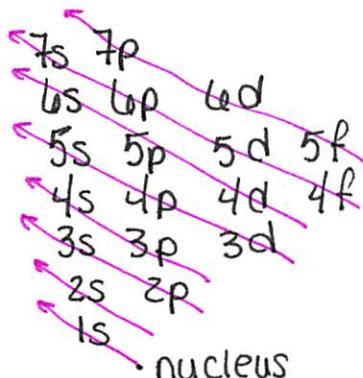
12 prs. available  
- 3 bonding prs

S-center  
O-ends



56. Review from previous tests.

Double bond was necessary  
bc lone pairs were used up but  
the sulfur atom in the center  
did not have 4 pairs of e's built.



- a. Write electron configurations for:
- Fe  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$  or  $[\text{Ar}]4s^2 3d^6$   
 $26e^-$
  - Si  $1s^2 2s^2 2p^6 3s^2 3p^2$  or  $[\text{Ne}]3s^2 3p^2$   
 $14e^-$
  - Rb  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^1$  or  $[\text{Kr}]5s^1$   
 $37e^-$

- b. How many protons, electrons, and neutrons are in

i.  ${}_{40}^{91}\text{Zr}$

$$\#p^+ = 40$$

$$\#e^- = 40$$

$$\#n^0 = 91 - 40 = 51$$

ii.  $^{227}_{89}\text{Ac}$

$$\# p^+ = 89$$
$$\# e^- = 89$$
$$\# n^o = 227 - 89 = 138$$