Chemical Formulas

16.2

Your paper should look like this…

Chemical Formulas

Chemical Formulas

Oxidation #'s

Predicting Types of Bonds

Chemical Formulas

Ox. # & Chemical formulas

Binary Compounds

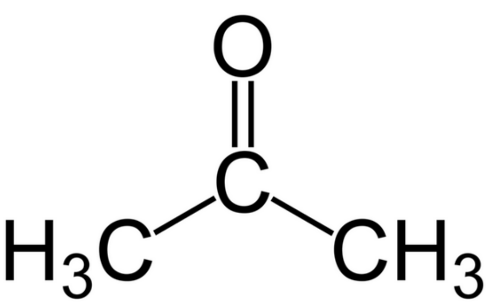
Naming Compounds

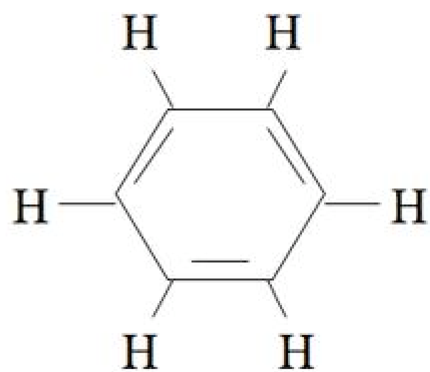
YOU TRY

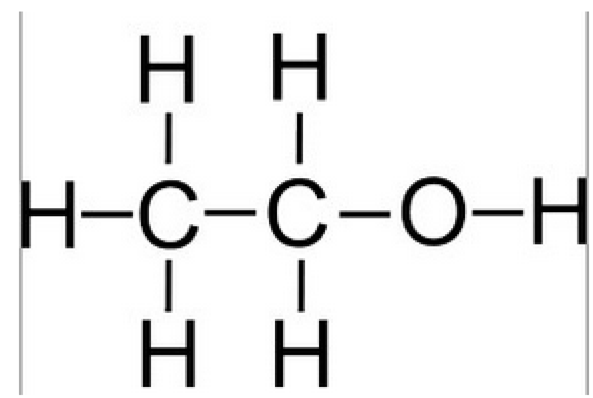
Chemical Formulas

<u>Chemical Formula</u>: Tells you each element and how many atoms of that element are in the compound, and sometimes, how the atoms are connected

Ex. C_3H_6O C_6H_6 C_2H_5OH







Chemical Formulas

- A coefficient is how many molecules of that compound there are
- Ex. $3H_2O$ $4C_6H_6$

6 hydrogens (3*2)

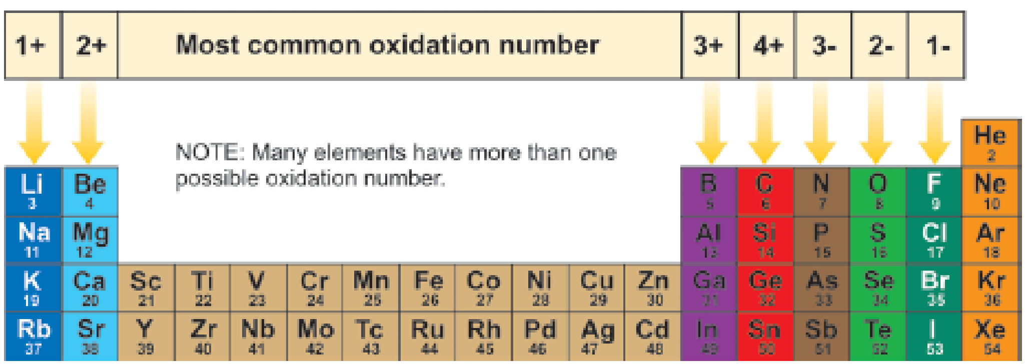
3 oxygen (3*1)

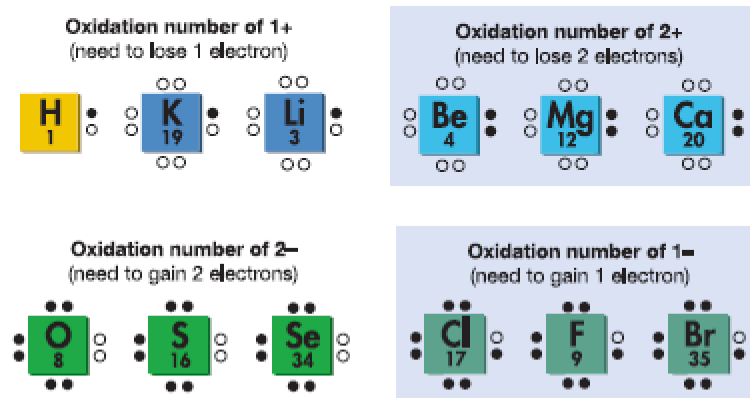
24 carbons (4*6)

24 hydrogens (4*6)

Oxidation Numbers

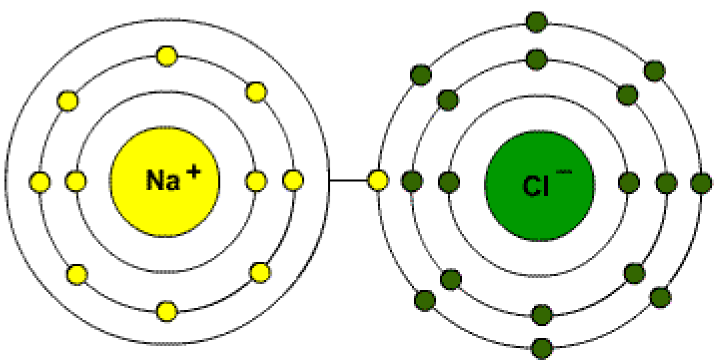
- Oxidation #: a quantity that indicates the charge on an atom when it gains, loses, or shares e- during bond formation
- Related to valence e- # but many atoms have more than one ox. # possible

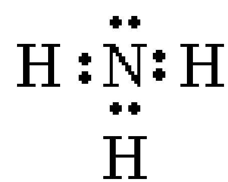




Predicting Bonds

- Atoms are going to bond in order to fill their outer shell





Oxidation #'s & Chemical Formulas

1. If pure element, ox. # = 0

   $Fe_{(s)}$ $Xe_{(g)}$ $H_{2(g)}$

2. Hydrogen is ALWAYS +1
3. Oxygen is ALWAYS -2

   H_2O HCl
   C_2H_6 $C_6H_{12}O_6$

4. First column elements +1
5. Other atoms get the charge they prefer as long as the SUM of all the atoms ox. #'s equals the overall charge of the compound

Fe_2O_3 ClO_3^- NaH_2PO_4

Concept Check

What is the oxidation number of Fe_8?

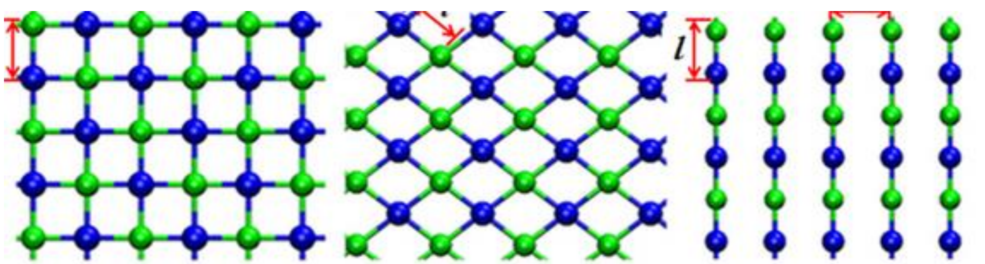
ZERO! It is a pure element

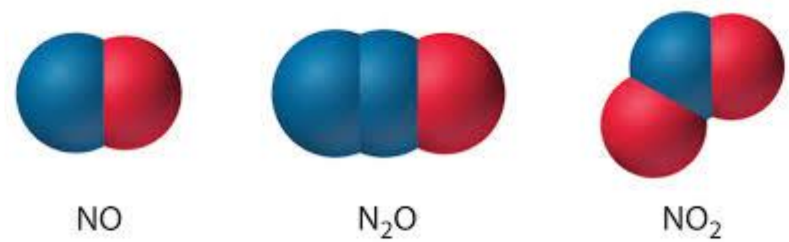
What is the oxidation number of P_4?

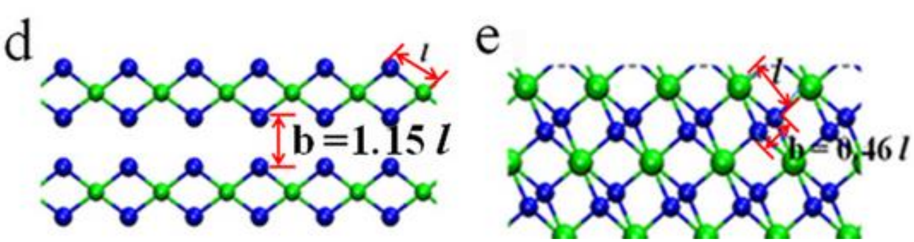
ZERO! It is a pure element

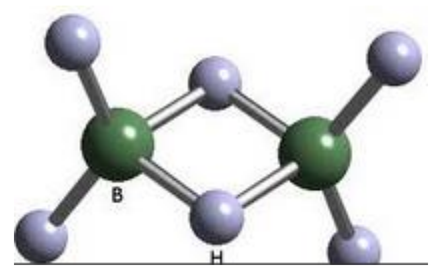
Binary Compounds

- A compound with only two elements in it, with no regard to how many atoms of each element are present









Naming Compounds

- Binary Compounds
  - Write the name of first element
  - Write the root name of the second element
  - Add suffix "-ide"

- Polyatomic Compounds
  - Write name of first element using the "cheat chart"
  - Write the name of the second element using the "cheat chart"

You Try

Oxidation #	Name of Ion	Formula
1+	Ammonium	NH_4^+
1-	Acetate	$C_2H_3O_2^-$
2-	Carbonate	CO_32^-
2-	Chromate	CrO_42^-
1-	Hydrogen carbonate	HCO_3^-
1+	Hydronium	H_3O^+
1-	Hydroxide	OH^-
1-	nitrate	NO_3^-
2-	Peroxide	O_2^{2-}
3-	Phosphate	PO_4^{3-}
2-	Sulfate	SO_4^{2-}
2-	Sulfite	SO_3^{2-}

1. $MgBr_2$

   Magnesium bromide

1. $FeCl_3$

   Iron Chloride

1. NH_4Cl

   Ammonium Chloride

1. Cu_2SO_3

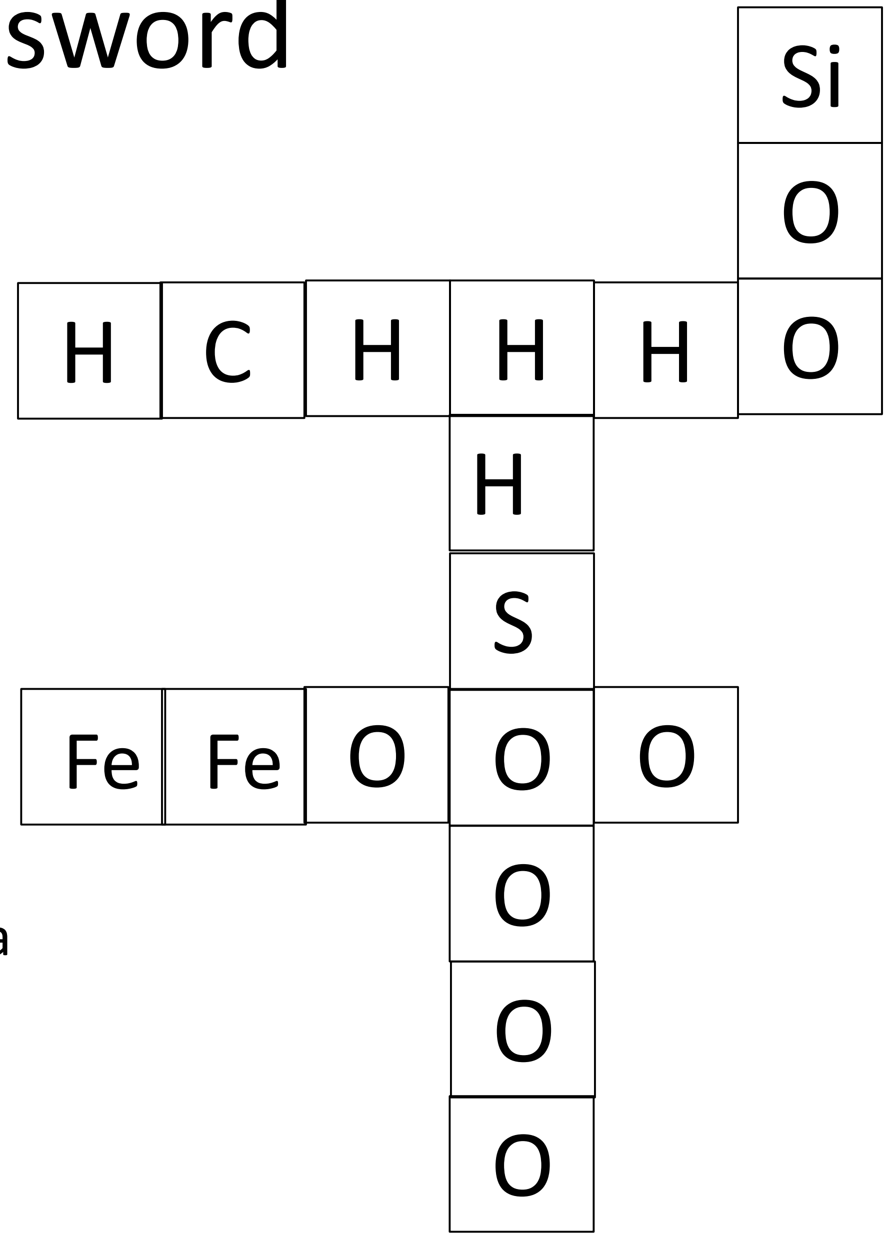
   Copper Sulfite

Lab 16B

Element 1	Element 2	Ox. # 1	Ox. # 2	# of tiles of 1	# of tiles of 2	Chemical Formula
Hydrogen	Fluorine	+1	-1	1	1	HF
Magnesium	Sulfur	+2	-2	1	1	MgS
Calcium	Bromine	+2	-1	1	2	$CaBr_2$
Aluminum	Oxygen					
Potassium	Chlorine					
Lithium	Argon					
Rubidium	Sulfur					

16B crossword

- Get in groups of 4-5.
- Close your eyes and pick 30 tiles from the element bag
- In your groups build a crossword of compounds using the oxidation numbers
- Always put the positive element first
- Try to use as many tiles as you can
- When you're done, draw your crossword with the oxidation numbers you used.
- Count up your total points using the atomic number…don't forget to count a tile twice if it's used in more than one compound



Lab 16B

Element 1	Element 2	Ox. # 1	Ox. # 2	# of tiles of 1	# of tiles of 2	Chemical Formula
Hydrogen	Fluorine	+1	-1	1	1	HF
Magnesium	Sulfur	+2	-2	1	1	MgS
Calcium	Bromine	+2	-1	1	2	$CaBr_2$
Aluminum	Oxygen	+3	-2	2	3	Al_2O_3
Potassium	Chlorine	+1	-1	1	1	KCl
Lithium	Argon	+1	0	-	-	N/A
Rubidium	Sulfur	+1	-2	2	1	Ru_2S