

## Announcements – Lecture V– Tuesday, Sep 16<sup>th</sup>

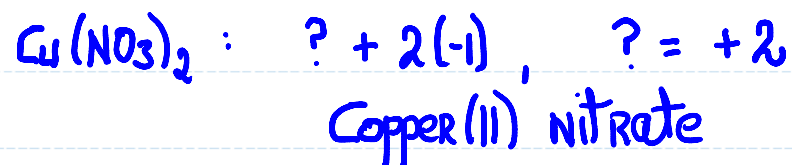
<b>Unassigned iClickers</b>	<b>No iClicker Registered</b>		
	<b>SID</b>	<b>Last</b>	<b>First</b>
803B16AD			
80489B53	26207279	Apiri	James
80888880	28819600	Beynor	Jacklyn
80B5CDF8	28847017	Fitzgerald	Karly
80BB003B	28878277	Ford	Helena
835837EC	28803233	Hebert	Alexis
83983328	24766907	Johnsen	Carl
8813168D	26004944	Laffey	Conor
8FA3B894	28164064	Milone	Maximilian
91C29DCE	26036657	O'Dea	Derek
95498F53	28816374	Riccie	Carlie
9631983F	28810094	Siegel	Jaime
	29286876	Weil	Alexandra

## Announcements – Lecture V– Tuesday, Sep 16<sup>th</sup>

1. **First Lab – Saturday, September 20<sup>th</sup> ... 1-4pm ... ISB 155/160 (A-E)**
  - a) *Read the **Lab Policy** prior to the this lab.*
  - b) *Print lab prior to coming to lab -- use the '**Print Friendly Version**' located on the top left hand side of the page – this is the version that contains the '**Data Sheet**' that you will hand in upon completing the lab.*
  - c) *Review the sample quiz on class web site – a short 6 question quiz will be administered at the start of the lab – questions taken from the sample questions.*

3.6 How Do We Predict Formulas and Name Ionic Compounds.  
B Transition Metals

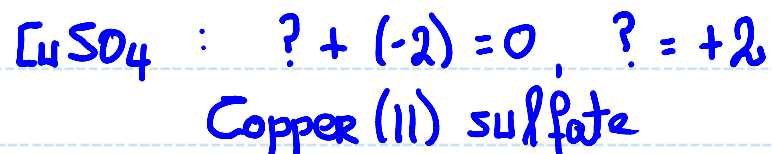
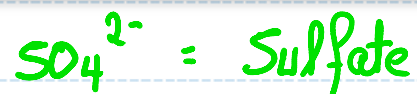
What is the correct name for the ionic compound  $\text{Cu}(\text{NO}_3)_2$



What is the correct name for the ionic compound  $\text{CuSO}_4$

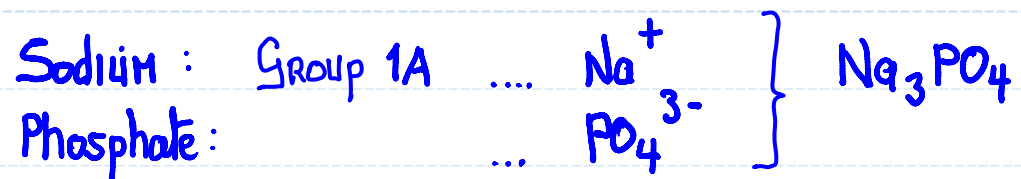


- |                              |                       |
|------------------------------|-----------------------|
| a) Copper(I) sulfate         | b) Copper(I) sulfite  |
| <b>c) Copper(II) sulfate</b> | d) Copper(II) sulfite |

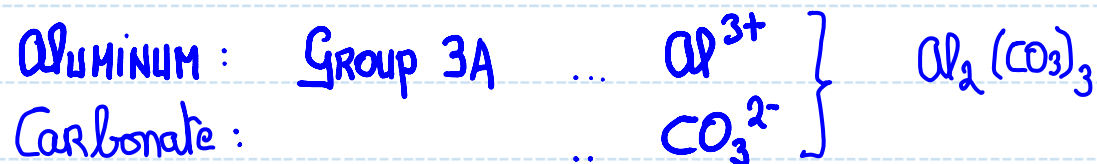


### 3.6 How Do We Predict Formulas and Name Ionic Compounds. C Polyatomics

Give the correct chemical formula for the ionic compound, sodium phosphate.



Give the correct chemical formula for the ionic compound, aluminum carbonate.



Note the use of ( ) when dealing with polyatomic ions  
 $\text{Al}_2(\text{CO}_3)_3$  and not  $\text{Al}_2\text{C}_3\text{O}_9$

### 4.3 What Is a Mole and How Do We Use It to Calculate Mass Relationships?

What is the mass in grams of 1 mole of Li.

${}^6\text{Li}$ :	6.015 amu	7.42%
${}^7\text{Li}$ :	7.016 amu	92.58%

$$N = 6.0221 \times 10^{23} \text{ mol}^{-1}$$

$$1 \text{ amu} = 1.6606 \times 10^{-24} \text{ g}$$

$$1 \text{ atom: } 0.0742 (6.015) + 0.9258 (7.016) = \boxed{6.9417 \text{ amu}}$$

$$\frac{6.9417 \text{ amu}}{1 \text{ amu}} \times 1.6606 \times 10^{-24} \text{ g} = 1.1527 \times 10^{-23} \text{ g}$$

$$\begin{aligned} 1 \text{ atom of Li} &: 1.1527 \times 10^{-23} \text{ g} \\ 1 \text{ mol of Li} &: 1.1527 \times 10^{-23} \text{ g} (6.0221 \times 10^{23} \text{ mol}^{-1}) \\ &= \boxed{6.9417 \text{ g. mol}^{-1}} \end{aligned}$$

### 4.3 What Is a Mole and How Do We Use It to Calculate Mass Relationships. Molar Mass ... (Formula Weight)

Al	Si	P	S
13	14	15	16
26.98	28.09	30.97	32.07

Al: 26.98 g.mol<sup>-1</sup>

P: 30.97 g.mol<sup>-1</sup>



$$4(12.01) + 10(1.01) = 58.14 \text{ g.mol}^{-1}$$

Molar Mass

$$\text{Reminder: } 58.14 \text{ g.mol}^{-1} = \frac{58.14 \text{ g}}{1 \text{ mol}}$$

### 4.3 What Is a Mole and How Do We Use It to Calculate Mass Relationships.

#### Example 1

a) How many ATOMS of fluorine are present in 3.30 moles of  $\text{BF}_3$ ?

b) How many MOLES of fluorine are present in  $3.09 \times 10^{22}$  molecules of  $\text{BF}_3$ ?

$$N = 6.023 \times 10^{23}$$

$$\text{a) } \frac{3.30 \text{ mol } \text{BF}_3}{1 \text{ } \text{BF}_3} \times \frac{3 \text{ F}}{1 \text{ } \text{BF}_3} = 9.90 \text{ mol F}$$

$$\frac{9.90 \text{ mol F}}{1 \text{ mol}} \times \frac{6.023 \times 10^{23} \text{ atoms}}{1 \text{ mol}} = 5.96 \times 10^{24} \text{ atoms F}$$

$$\text{b) } \frac{3.09 \times 10^{22} \text{ molecules } \text{BF}_3}{6.023 \times 10^{23} \text{ molecules}} \times \frac{1 \text{ mol}}{1 \text{ } \text{BF}_3} = 0.0513 \text{ mol } \text{BF}_3$$

$$\frac{0.0513 \text{ mol } \text{BF}_3}{1 \text{ } \text{BF}_3} \times \frac{3 \text{ F}}{1 \text{ } \text{BF}_3} = 0.154 \text{ mol F}$$

5.3 What Is a Mole and How Do We Use It to Calculate Mass Relationships.  
Example 2

How many **MOLES** of water are present in 5.41 grams of this compound ?



O: 16.0

H: 1.01

a) 0.1

b) 0.2

c) 0.3

d) 0.4

e) Help

5.41 g water  $\rightarrow$  ? mol water

H<sub>2</sub>O : 2(H) + O

$2(1.01) + 16.0 = 18.02 \text{ g} \cdot \text{mol}^{-1}$  ....  $\frac{18.02 \text{ g}}{1 \text{ mol}}$

$$\frac{5.41 \text{ g water}}{18.02 \text{ g}} \times \frac{1 \text{ mol}}{1} = 0.3 \text{ mol water}$$



### 5.3 What Is a Mole and How Do We Use It to Calculate Mass Relationships. Example 3

How many **Grams** of ethanol ( $\text{CH}_3\text{CH}_2\text{OH}$ ) are present in 0.61 moles of this compound?



C: 12.01

H: 1.01

O: 16.0

a) 46

b) 96

c) 28

d) Help



$$2(12.01) + 6(1.01) + 16.0 = 46.08 \text{ g}\cdot\text{mol}^{-1}$$

$$\left( \frac{46.08 \text{ g}}{1 \text{ mol}} \right)$$

$$\frac{0.61 \text{ mol } \text{CH}_3\text{CH}_2\text{OH}}{1 \text{ mol}} \left| \frac{46.08 \text{ g}}{1 \text{ mol}} \right. = 28.1 \text{ g } \text{CH}_3\text{CH}_2\text{OH}$$