Announcements – Lecture IV – Thursday, May 22nd

1. **Class Web Site:**   **www.chem.umass.edu/genchem**

2. **Add/Drop:**   **Friday, May 23rd**

3. **No Class:**   **Monday, May 26th , Memorial Day**

4. **First Lab:**   **Tuesday, May 27th , ISB 155**

A certain element consists of two stable isotopes:

	Exact Mass (amu)	Abundance (%)
#1	112.9043	4.28
#2	114.9041	95.72

What is the average atomic mass of this element?

Give answer to 6 significant figures

$$0.0428(112.9043) + 0.9572(114.9041) = 114.818\,5086$$

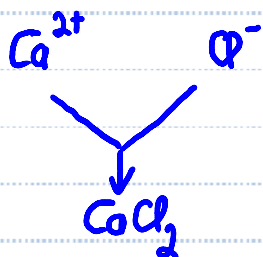$$114.819 \text{ amu}$$

2.4   **Ions and Ionic Compounds**

     a) Formulas and Names – Metal + Nonmetal

What is the formula and name of the Ionic compound produced by Calcium and Chlorine?

Calcium ... Group 2A .. +2

Chlorine ... Group 7A ... -1

Ca^{2+} Cl^{-}

$CaCl_2$

NAMING:

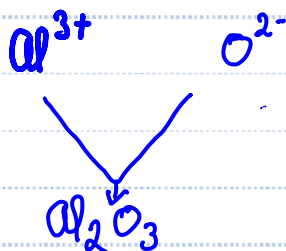Cation Name comes first

Calcium chloride

2.4 Ions and Ionic Compounds
a) Formulas and Names – Metal + Nonmetal

What is the formula and name of the Ionic compound produced by Oxygen and Aluminum?

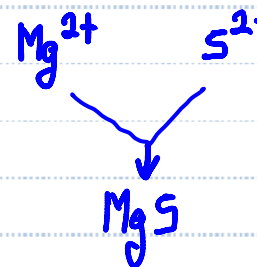Oxygen ... Group 6A ... -2

Aluminum ... Group 3A ... $+3$

Al^{3+} O^{2-}

Al_2O_3

Aluminum oxide

What is the formula and name of the Ionic compound produced by Magnesium and Sulfur?

Magnesium ... Group 2A ... $+2$

Sulfur ... Group 6A ... -2

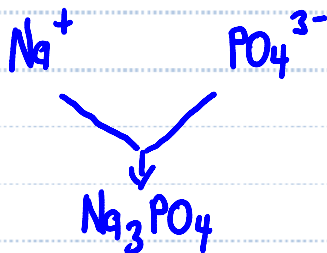Mg^{2+} S^{2-}

MgS

Magnesium sulfide

2.4   Ions and Ionic Compounds
b) Formulas and Names – Metal + Polyatomic

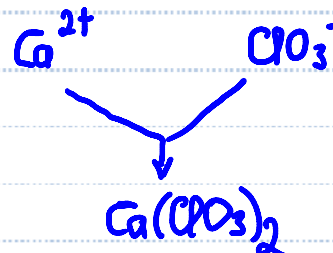Give the correct chemical formula for the ionic compound, sodium phosphate.

Give the correct chemical formula for the ionic compound, calcium chlorate.

Sodium   ...   GROUP 1A   ...   +1

Phosphate   ... PO_4^{3-} ...   -3

Na^+ PO_4^{3-}

Na_3PO_4

Calcium   ...   GROUP 2A   ...   +2

Chlorate   ... ClO_3^- ...   -1

Ca^{2+} ClO_3^-

$Ca(ClO_3)_2$

Note the use of parenthesis

$Ca(ClO_3)_2$ and not $CaCl_2O_6$

2.4　Ions and Ionic Compounds
d) Formulas and Names – Transition Metals

What is the correct chemical formula for the ionic compound Iron oxide. ✗

Oxygen ... Group 6A ... -2

Iron ... Group 8B ... ?

→ Ambigious Name!

The Name should be such so as to indicate the charge that is on the **Transition Metal**.

What is the correct name for the ionic compound $Cu(NO_3)_2$

$Cu(NO_3)_2$

$Cu :$　?

$2 \times NO_3^- :$　-2
$$\overline{0}$$

$\Rightarrow ? = +2$

Copper(II) Nitrate

Roman Numerals used to desiginate the charge on the Transition metal.

Is this always adhered to ... No
　　　　　　　in OWL ... No
　　　　　　in this class ... YES
　　　　　in my exams ... YES

3.1   The Mole and Molar Mass
b) Molar Mass

What is the mass in grams of 1 mole of Li.   Av. No = 6.023×10^{23}

^{6}Li: 6.015 amu   7.42%

^{7}Li: 7.016 amu   92.58%   { 1 amu = 1.6605×10^{-24}g}

$$0.0742\,(6.015) + 0.9258\,(7.016) = \boxed{6.942 \text{ amu}}$$

$$\frac{6.942 \text{ amu} \mid 1.6605 \times 10^{-24}\text{g}}{\mid 1 \text{ amu}} = 1.153 \times 10^{-23}\text{g per atom}$$

$$1.153 \times 10^{-23}\text{g}\,(6.023 \times 10^{23}) = \boxed{6.942 \text{ g per mol}} \qquad (6.942 \text{ g.mol}^{-1})$$