Announcements – Lecture V– Tuesday, Sep 22nd

Unregistered i›clicker(s)

Remote ID	Total	Average
#803754E3	1.00	1.00
#964802DC	1.00	1.00
#99BB2301	1.00	1.00
#9E4B0EDB	1.00	1.00
#9E97878E	1.00	1.00
#9E9D2A29	1.00	1.00
#9EA8CAFC	1.00	1.00
#9EB6FAD2	1.00	1.00
#9EC7CA93	1.00	1.00
#9ED3337E	1.00	1.00
#9ED83B7D	1.00	1.00

Unregistered student(s)

Last Name	First Name	Student ID
Stanhope	Jeffrey	25912724
Canty	Charles	26613426
Bloch	Eli	26624588
Eicholtz	Nicolette	26828903
Galligan	Sydney	27206915
Piper	Michael	27252463
Kenney	Joseph	28796534
Dowd	Sam	29187604
Reineke	Eva	29281821
Kerr	Cameron	29282396
Postilnik	Leah	29288816
Yeh	Rebecca	29355691
Escano	Katharyn	29560014
Brennan	Megan	29658222
Ortiz	Barbara	29970702

Announcements – Lecture V– Tuesday, Sep 22nd

1. **First Lab – Saturday, September 26th … 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.

2. 

iClicker:
Choose any letter: A-E

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

NO_3^- = nitrate

$Cu(NO_3)_2$: $? + 2(-1) = 0$

$? = +2$

Copper (II) nitrate

What is the **correct name** for the ionic compound $CuSO_4$?

a) Copper(I) sulfate
b) Copper(I) sulfite
c) Copper(II) sulfate ✓
d) Copper(II) sulfite

SO_4^{2-} = sulfate

$CuSO_4$: $? + (-2) = 0$

$? = 2$

Copper (II) sulfate

3.6 How Do We Predict Formulas and Name Ionic Compounds.

C *Polyatomics*

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

Sodium : Group 1A +1

Phosphate : PO_4^{3-}

Na^+ PO_4^{3-}

Na_3PO_4

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

Aluminum : Group 3A +3

Carbonate : CO_3^{2-}

Al^{3+} CO_3^{2-}

$Al_2(CO_3)_3$

Note the use of ( ) when dealing with polyatomics.

$Al_2(CO_3)_3$ **not** $Al_2C_3O_9$!

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}Li:	6.015 amu	7.42%
^{7}Li:	7.016 amu	92.58%

$N = 6.0221 \times 10^{23}\ mol^{-1}$ $\qquad$ $1\ amu = 1.6606 \times 10^{-24} g$

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

$$6.9417\ amu \left| \frac{1.6606 \times 10^{-24} g}{1\ amu} \right. = 1.1527 \times 10^{-23} g$$

1 atom of Li : $1.1527 \times 10^{-23} g$

1 mol of Li : $1.1527 \times 10^{-23} g\ (6.0221 \times 10^{23}\ mol^{-1})$

$= \boxed{6.9417\ g.mol^{-1}}$!

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^{-1}

↳ S : 32.07 g.mol^{-1}

C_4H_{10} : 4(C) + 10(H)

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

↳ Molar Mass

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

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

Example 1

How many **ATOMS** of fluorine are present in **3.30** moles of BF_3?

$N = 6.023 \times 10^{23}\ mol^{-1}$

$$3.30\ mol\ BF_3 \left| \frac{3\ F}{1\ BF_3} \right. = 9.90\ mol\ F$$

BF_3 : 1B + 3F

$$9.90\ mol\ F \left| \frac{6.023 \times 10^{23}\ atoms}{1\ mol} \right. = 5.96 \times 10^{24}\ atoms\ F$$

$$6.023 \times 10^{23}\ mol^{-1} = \frac{6.023 \times 10^{23}}{1\ mol}$$

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

Example 2

How many **MOLES** of fluorine are present in **3.09×10^{22} molecules** of **BF_3**?

$N = 6.023 \times 10^{23}\ mol^{-1}$

$$3.09 \times 10^{22}\ \text{molecules } BF_3 \left| \frac{1\ \text{mol}}{6.023 \times 10^{23}\ \text{molecules}} \right. = 0.0513\ \text{mol } BF_3$$

$$6.023 \times 10^{23}\ mol^{-1} = \frac{6.023 \times 10^{23}}{1\ \text{mol}}$$

$$0.0513\ \text{mol } BF_3 \left| \frac{3\ F}{1\ BF_3} \right. = 0.154\ \text{mol } F$$

BF_3 : 1B + 3F

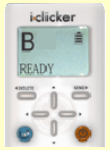
5.3 What Is a Mole and How Do We Use It to Calculate Mass Relationships.

Example 3

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

$5.41\ g\ H_2O \rightarrow ?\ mol\ H_2O$

H_2O : $2(H) + O$

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

$$5.41\ g\ H_2O \left| \frac{1\ mol}{18.02\ g} \right. = 0.3\ mol\ H_2O$$

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

Example 4

How many Grams of ethanol (CH_3CH_2OH) are present in 0.61 moles of this compound ?

a) 46 b) 96 c) 28 ✓ d) Help

C : 12.01
H : 1.01
O : 16.00

CH_3CH_2OH : $2(C) + 6(H) + O$

$2(12.01) + 6(1.01) + 16.00 = 46.08\ g.mol^{-1}$ ... $\frac{46.08\ g}{1\ mol}$

$0.61\ mol\ CH_3CH_2OH \left| \frac{46.08\ g}{1\ mol} \right. = 28.1\ g\ CH_3CH_2OH$

4.4 How Do We Balance Chemical Equations?

Example 1

Balance the following chemical equation:

$$\underline{2}\ Fe_2O_3(s) + \underline{3}\ C(s) = \underline{4}\ Fe(s) + \underline{3}\ CO_2(g)$$

Reactants					✓
Fe	2	2	4	4	4
O	3	3	6	6	6
C	1	1	1	1	3

Products					✓
Fe	1	2	2	4	4
O	2	2	6	6	6
C	1	1	3	3	3

$$2\ Fe_2O_3(s) + 3\ C(s) = 4\ Fe(s) + 3\ CO_2(g)$$