TODAY + TOMORROW ARE ALL REVIEW

PURPOSE: Get Solid for Friday's Test.

WARMUP: GLUE/TAPE/STAPLE INTO YOUR NOTEBOOK

Warmup, from October: Convert 49 g of oxygen to moles.

$49\ grams\ O_2 \times \left(\frac{1\ mol}{32\ grams}\right) = 1.53\ moles\ O_2$

Quiestion ype 1

Iron metal and oxygen combine to form the magnetic oxide of iron, Fe_3O_4. How many moles of iron can be converted to magnetite by 8.80 moles of pure oxygen? (make your BCA table)

	$3Fe$	$+ 2O_2$	$\rightarrow$	$1\ Fe_3O_4$
B	?	8.80 mol		ZERO
C	(-13.2)	(-8.80)		(+4.40)
A	Zero	ZERO		4.40

ANSWER: 13.2 moles Fe

Quiestion ype 2

Uisng the aqbove balanced equation, If 300. grams of O2 react, how many grams of Fe_3O_4 should ~~form~~? **This is the , circle one, (actual yield / theoretical yield)**

convert to moles first!

$300\ grams\ O_2 \times \left(\frac{1\ mol\ O_2}{32.00\ grams\ O_2}\right) = 9.375\ mol\ O_2$

	$3Fe + 2O_2$	$\rightarrow$	$1\ Fe_3O_4$
B	? 9.375 mol		ZERO
C	-14 mol -9.375 mol		+4.6875 mol
A	ZERO		4.6875 mol

Answer

$4.68 \times \frac{231}{1} = 1080\ grams$

Answer: 1080 grams

Quiestion ype 3

In the previous problem, if only 423 grams of Fe_3O_4 form, what was the percent yield?

$\frac{423\ grams}{1080\ grams} \times 100 = 39.1\%$

Tips for solving B. C. A Tables

★) ALWAYS BALANCE THE EQUATION AND WRITE IT ABOVE THE B.C.A. TABLE

★) NEVER WRITE ANYTHING INSIDE THE B.C.A. TABLE EXCEPT `MOLES'

★) ON THE "CHANGE" LINE GO SIDEWAYS USING MOLE RATIOS (THE COEFFICIENTS FROM THE BALANCED EQUATION).

KEEP YOUR LAB SAFE.
WE WILL FINISH IT
FRIDAY, AFTER THE TEST

DO A GOOD JOB
ON TONIGHT'S MALALA
SHEET -- WE WILL
WHITEBOARD TOMORROW

TUESDAY'S NOTES - - -

PURPOSE How Do We SAY How WELL OUR LAB WENT?

#1) "THEORETICAL YIELD"

is how much we predict We will get

#2) "ACTUAL YIELD"

How MUCH WE ACTUALLY GET.

#3) "Percent Yield"

$$\%\,yield = \frac{Actual\ Yield}{Theoretical\ Yield} \times 100$$

[redacted]

Name_____

Period_____

Get extra credit: nominate a woman for women's history month. Go to the class website.

For each of the problems below:
a. Write the balanced chemical equation.
b. Identify the given (with units) and what you want to find (with units).
c. Show set up with units. Check sig figs, give final answer with units and label.

1. Using the Hoffman apparatus for electrolysis, a chemist decomposes 36 g of water into its gaseous elements. How many grams of hydrogen gas should she get (theoretical yield)?

Bal. Equation: $2\ H_2O \rightarrow 2\ H_2 + O_2$

$36\ g\ H_2O \times \left(\frac{1\ mol\ H_2O}{18.02\ g\ H_2O}\right) = 2.00\ mol\ H_2O$

	$2\ H_2O$	$\rightarrow$	$2\ H_2$	+	O_2
Before	2.00 mol		0 mol		0 mol
Change	−2.00 mol		+2.00 mol		+1.00 mol
After	0 mol		2.00 mol		1.00 mol

$2.00\ mol\ H_2 \times \left(\frac{2.02\ g\ H_2}{1\ mol\ H_2}\right) = \boxed{4.04\ g\ H_2}$

2. Recall that liquid sodium reacts with chlorine gas to produce sodium chloride. You want to produce 581 g of sodium chloride. How many grams of sodium are needed?

3. You eat 180.0 g of glucose (90 M&Ms). If glucose, $C_6H_{12}O_6$, reacts with oxygen gas to produce carbon dioxide and water, how many grams of oxygen will you have to breathe in to burn the glucose?

4. Suppose 4.61 g of zinc was allowed to react with hydrochloric acid to produce zinc chloride and hydrogen gas. How much zinc chloride should you get?
Suppose that you actually recovered 8.56 g of zinc chloride. What is your percent yield?

5. Determine the mass of carbon dioxide that should be produced in the reaction between 3.74 g of carbon and excess O_2. What is the % yield if 11.34 g of CO_2 is recovered?

6. In the reaction between excess K(s) and 4.28 g of O_2(g), potassium oxide is formed . What mass would you *expect* to form (theoretical yield)? If 17.36 g of K_2O is *actually* produced, what is the percent yield?

7. Determine the mass of carbon dioxide one could expect to form (and the percent yield) for the reaction between excess CH_4 and 11.6 g of O_2 if 5.38 g of carbon dioxide gas is produced along with some water vapor.

8. Determine the mass of water vapor you would expect to form (and the percent yield) in the reaction between 15.8 g of NH_3 and excess oxygen to produce water and nitric oxide (NO). The mass of water actually formed is 21.8 g.

$4\,NH_3 + 5\,O_2 \longrightarrow 6\,H_2O + 4\,NO$

	$4\,NH_3$	$5\,O_2$	$6\,H_2O$	$4\,NO$
B	0.927 mol	XS	0 mol	0 mol
C	− 0.927 mol		+ 1.39 mol	
A	0 mol		1.39 mol	

$\frac{21.8\,g}{25.0\,g} \times 100 = 87.3\%$

$15.8\,g\,NH_3 \times \left(\frac{1\,mol\,NH_3}{17.04\,g\,NH_3}\right) = 0.927\,mol\,NH_3$ $\qquad$ $1.39\,mol\,H_2O \times \left(\frac{18.02\,g\,H_2O}{1\,mol\,H_2O}\right) = 25.0\,g\,H_2O$

Check your answers (1) 4.0 g H_2 (2) 228 g Na (3) 192 g O_2 (4) 9.61 g Zn, 89.1%
(5) 13.73 g CO_2, 82.6% (6) 25.3 g K_2O, 68.8% (7) 7.99 CO_2, 67.4% (8) 25.1 g H_2O, 86.9%