

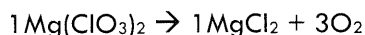
Stoichiometry Extra Practice

Solve each of the following problems using the method you were shown in class. You must show all work. You must circle your final answer which must include the formula of the compound you are finding.

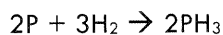
1. *Learning Target 1* This is a Worksheet #1 Grams to Grams Problem: How many **grams of hydrogen H₂** would be produced when **185 grams of lithium Li** reacts?



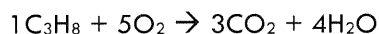
2. *Learning Target 2* This is a Worksheet #2 Grams to Liters Problem: How many **liters of oxygen O₂**, measured at STP, will be produced by thermally decomposing **445 grams of magnesium chlorate Mg(ClO₃)₂**?



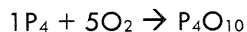
3. *Learning Target 3* This is a Worksheet #3 Liters to Liters Problem: How many **liters of hydrogen H₂**, measured at STP, would be needed to react with phosphorus to produce **112 liters of phosphine PH₃**?



4. *Learning Target 4:* How many **liters of propane C₃H₈** are needed to produce **325 grams of water H₂O**?



5. Learning Target 4: How many **grams of tetraphosphorus decaoxide P₄O₁₀** are formed if **25.0 grams of oxygen O₂** is reacted.



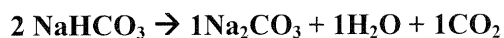
6. Chemistry Lab Question: Thermal Decomposition of Baking Soda (sodium bicarbonate NaHCO₃)

Part 1: Use the sample data below to calculate the starting mass of sodium bicarbonate:

Data:

Mass of crucible and sodium bicarbonate NaHCO ₃	<u>25.635</u>	g
Mass of crucible	<u>19.755</u>	g
Starting mass of sodium bicarbonate NaHCO ₃	- _____	g

Part 2: Do a NEAT, PROPERLY LABELED Mass-Mass Calculation where **the information you are given is the starting mass (in grams) of NaHCO₃** and **what you want to find is the number of grams of Na₂CO₃** that will be produced.



grams Na₂CO₃ = _____ grams NaHCO₃

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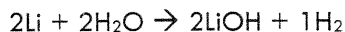
 = _____

Stoichiometry Extra Practice

Solve each of the following problems using the method you were shown in class. You must show all work. You must circle your final answer which must include the formula of the compound you are finding.

1. How many grams of hydrogen H_2 would be produced when 185 grams of lithium Li reacts?

$$H_2: 2.02 \text{ g/mol}$$

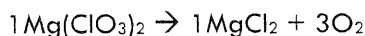


$$Li: 6.94 \text{ g/mol}$$

$$? \text{ g } H_2 = 185 \text{ g Li} \left| \frac{1 \text{ mol Li}}{6.94 \text{ g Li}} \right| \left| \frac{1 \text{ mol } H_2}{2 \text{ mol Li}} \right| \left| \frac{2.02 \text{ g } H_2}{1 \text{ mol } H_2} \right| = \boxed{26.93 \text{ g } H_2}$$

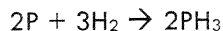
2. How many liters of oxygen O_2 , measured at STP, will be produced by thermally decomposing 445 grams of magnesium chlorate $Mg(ClO_3)_2$?

$$\begin{array}{r} Mg(ClO_3)_2 \quad 24.31 \\ \quad \quad \quad 70.90 \\ \quad \quad \quad 96.00 \\ \hline 191.21 \text{ g/mol} \end{array}$$



$$? \text{ L } O_2 = 445 \text{ g } Mg(ClO_3)_2 \left| \frac{1 \text{ mol } Mg(ClO_3)_2}{191.21 \text{ g } Mg(ClO_3)_2} \right| \left| \frac{3 \text{ mol } O_2}{1 \text{ mol } Mg(ClO_3)_2} \right| \left| \frac{22.4 \text{ L } O_2}{1 \text{ mol } O_2} \right| =$$

3. How many liters of hydrogen H_2 , measured at STP, would be needed to react with phosphorus to produce 112 liters of phosphine PH_3 ?



$$? \text{ L } H_2 = 112 \text{ L } PH_3 \left| \frac{1 \text{ mol } PH_3}{22.4 \text{ L } PH_3} \right| \left| \frac{3 \text{ mol } H_2}{2 \text{ mol } PH_3} \right| \left| \frac{22.4 \text{ L } H_2}{1 \text{ mol } H_2} \right| = \boxed{168 \text{ L } H_2}$$

$$\boxed{156.39 \text{ L } O_2}$$

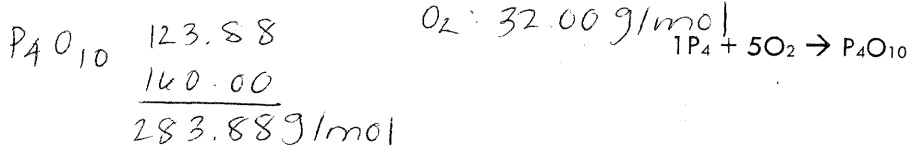
4. How many liters of propane C_3H_8 are needed to produce 325 grams of water H_2O ?



$$\begin{array}{r} H_2O: 2.02 \\ \quad \quad 16.00 \\ \hline 18.02 \text{ g/mol} \end{array}$$

$$? \text{ L } C_3H_8 = 325 \text{ g } H_2O \left| \frac{1 \text{ mol } H_2O}{18.02 \text{ g } H_2O} \right| \left| \frac{1 \text{ mol } C_3H_8}{4 \text{ mol } H_2O} \right| \left| \frac{22.4 \text{ L } C_3H_8}{1 \text{ mol } C_3H_8} \right| = \boxed{101.00 \text{ L } C_3H_8}$$

5. How many grams of tetraphosphorus decaoxide P_4O_{10} are formed if 25.0 grams of oxygen O_2 is reacted. 8 pts



$$? \text{ g } P_4O_{10} = 25 \text{ g } O_2 \left| \frac{1 \text{ mol } O_2}{32.00 \text{ g } O_2} \right| \frac{1 \text{ mol } P_4O_{10}}{5 \text{ mol } O_2} \left| \frac{283.88 \text{ g } P_4O_{10}}{1 \text{ mol } P_4O_{10}} \right| = \boxed{44.35 \text{ g } P_4O_{10}}$$

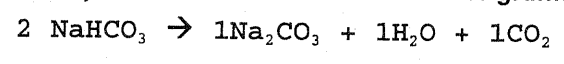
6. Chemistry Lab Question: Thermal Decomposition of Baking Soda (sodium bicarbonate $NaHCO_3$) 9 pts

Part 1: Use the sample data below to calculate the starting mass of sodium bicarbonate:

Data:

Mass of crucible and sodium bicarbonate $NaHCO_3$	25.635	g
Mass of crucible	19.755	g
Starting mass of sodium bicarbonate $NaHCO_3$	5.88	g

Part 2: Do a NEAT, PROPERLY LABELED Mass-Mass Calculation where the information you are given is the starting mass (in grams) of $NaHCO_3$ and what you want to find is the number of grams of Na_2CO_3 that will be produced.

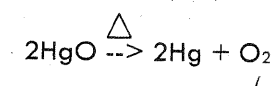


$$\# \text{ grams } Na_2CO_3 = \frac{5.88}{84.01 \text{ g } NaHCO_3} \times \frac{1 \text{ mol } NaHCO_3}{1 \text{ mol } NaHCO_3} \times \frac{1 \text{ mol } Na_2CO_3}{2 \text{ mol } NaHCO_3} \times \frac{105.99 \text{ g } Na_2CO_3}{1 \text{ mol } Na_2CO_3} = \boxed{3.71 \text{ g } Na_2CO_3}$$

Extra Credit Question: You must show work and include units to earn points!

+2 pts.

How many molecules of oxygen would be released by the thermal decomposition of 1.00 pound of mercury (II) oxide?



$$? \text{ 'cules } O_2 = 1 \text{ lb } \left| \frac{454 \text{ g } HgO}{1 \text{ lb } HgO} \right| \frac{1 \text{ mol } HgO}{216 \text{ g } HgO} \left| \frac{1 \text{ mol } O_2}{2 \text{ mol } HgO} \right| \frac{6.02 \times 10^{23} \text{ 'cules } O_2}{1 \text{ mol } O_2} =$$

$$\boxed{6.33 \times 10^{23} \text{ 'cules } O_2}$$