Name: _____

Period: ____ Subject: _____

Date: _____

Law of Definite Proportions

Solve for the appropriate value. Be sure to *show your work* and remember to use the correct number of significant figures.

1. _____ A 53.0 g sample of an unknown compound contains 13.5 g of oxygen. What is the percent by mass of oxygen in the unknown compound?

2. _____ If 11.1 g of hydrogen reacts completely with 88.6 g of oxygen to form hydrogen peroxide, what is the percent by mass of hydrogen in hydrogen peroxide?

3. _____ A 111.7 g sample of iron reacts with 100.0 g of oxygen to form iron oxide (rust). After the reaction, there is 52.0 g of unreacted oxygen remaining. What is the percent by mass of oxygen in the rust?

4. _____ If a 43.0 g sample of carbon dioxide (CO_2) is found to be 27.3% by mass carbon, then how much oxygen (in grams) is found in a 78.0 g sample of carbon dioxide?

5. _____ A 57.6 g sample of methane (CH_4) is found to contain 43.2 g of carbon. How much hydrogen (in grams) would a 37.8 g sample of methane contain?

1) $\frac{13.5\text{g O}}{53.0\text{g sample}} \times 100 = 25.5\%\text{ O}$

2) $H_2 + O_2 \rightarrow H_2O_2$

11.1g 88.6g

O C 99.7g

$\frac{11.1\text{g H}}{99.7\text{g } H_2O_2} \times 100\% = 11.1\%\text{ H}$

3.

$$4Fe + 3O_2 \rightarrow 2Fe_2O_3$$

111.7g 100g

0 52.0g 48.0g O + 111.7g Fe

159.7g Fe_2O_3

$$\frac{48g\ O}{159.7g\ Fe_2O_3} \times 100\% =$$

30.1% O

4. 78.0 g CO_2 x 0.273 =

21.3g C

78.0g CO_2 − 21.3g C

= 56.7g O

5) $\frac{43.2\text{g C}}{57.6\text{g CH}_4} \times 100\% =$

75% C

25% H

$37.8\text{g CH}_4 \times 0.25 =$

9.45g H