

Name: _____ Date: _____ Period: _____

Stoichiometry

1. Given the following equation: $2 \text{C}_4\text{H}_{10} + 13 \text{O}_2 \rightarrow 8 \text{CO}_2 + 10 \text{H}_2\text{O}$

Write the following molar ratios:

a. $\frac{\text{C}_4\text{H}_{10}}{\text{O}_2} \quad \frac{\text{mol C}_4\text{H}_{10}}{\text{mol O}_2}$

b. $\frac{\text{O}_2}{\text{CO}_2} \quad \frac{\text{mol O}_2}{\text{mol CO}_2}$

c. $\frac{\text{O}_2}{\text{H}_2\text{O}} \quad \frac{\text{mol O}_2}{\text{mol H}_2\text{O}}$

d. $\frac{\text{C}_4\text{H}_{10}}{\text{CO}_2} \quad \frac{\text{mol C}_4\text{H}_{10}}{\text{mol CO}_2}$

e. $\frac{\text{C}_4\text{H}_{10}}{\text{H}_2\text{O}} \quad \frac{\text{mol C}_4\text{H}_{10}}{\text{mol H}_2\text{O}}$

2. Given the following equation: $2 \text{KClO}_3 \rightarrow 2 \text{KCl} + 3 \text{O}_2$

How many moles of O_2 can be produced by reacting 12.0 moles of KClO_3 ?

3. Given the following equation: $2 \text{K} + \text{Cl}_2 \rightarrow 2 \text{KCl}$

How many grams of KCl (74.55 g/mol) is produced from 2.50 mol of K ?

How many grams of KCl (74.55 g/mol) is produced from 106 g of Cl_2 ?

4. Given the following equation: $\text{Na}_2\text{O} + \text{H}_2\text{O} \rightarrow 2 \text{NaOH}$

How many grams of NaOH (40.00 g/mol) is produced from 120 grams of Na_2O (61.98 g/mol)?

How many moles of Na_2O are required to produce 160 grams of NaOH (40.00 g/mol)?

5. Given the following equation: $8 \text{Fe} + \text{S}_8 \rightarrow 8 \text{FeS}$

What mass of iron, Fe, is needed to react with 16.0 grams of sulfur, S_8 ?

How many grams of iron, Fe, are reacted to form 16.0 grams of FeS (87.91 g/mol)?

6. Given the following equation: $2 \text{NaClO}_3 \rightarrow 2 \text{NaCl} + 3 \text{O}_2$

12.0 moles of NaClO_3 will produce how many grams of O_2 ?

How many grams of NaCl (58.44 g/mol) are produced when 80.0 grams of O_2 are produced?

7. Given the following equation: $\text{Cu} + 2 \text{AgNO}_3 \rightarrow \text{Cu(NO}_3)_2 + 2 \text{Ag}$

How many moles of Cu are needed to react with 350 g AgNO_3 (169.88 g/mol)?

If 89.5 grams of Ag were produced, how many grams of Cu reacted?

8. Molten iron and carbon monoxide are produced in a blast furnace by the reaction of iron(III) oxide and coke (pure carbon). If 25,000 grams of pure Fe_2O_3 (159.70 g/mol) are used, how many grams of iron can be produced? The reaction is: $\text{Fe}_2\text{O}_3 + 3 \text{C} \rightarrow 2 \text{Fe} + 3 \text{CO}$

9. The average human requires 120 grams of glucose (180.18 g/mol) per day. How many grams of CO_2 (44.01 g/mol) are required to produce this amount of glucose in plants?

The photosynthetic reaction is: $6 \text{CO}_2 + 6 \text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6 \text{O}_2$