Stoichiometry Practice: Variety Pack!

Name _____

Learning Target: By the end of the period, students will be able to use a balanced chemical equation to calculate the amount of any units of reactants needed and products made in a chemical reaction that goes to completion.

1) Magnetite is a very common iron oxide (Fe_3O_4) mineral that is found in igneous, metamorphic, and sedimentary rocks. It is the most commonly mined ore of iron. It is the mineral with the highest iron content (72.4%). When magnetite [iron(II) oxide] reacts with carbon monoxide it produces iron and carbon dioxide.

$$Fe_3O_4 + CO \rightarrow Fe + CO_2$$

a. Write the balanced equation below:

b. How many grams of iron are produced from 23.2 grams of carbon monoxide?

Answer:

c. How many grams of carbon dioxide are produced to react with 0.945 grams of Fe_3O_4?

Answer:

2) Ethylene (C_2H_4) burns in excess oxygen to form carbon dioxide and water vapor.

$$C_2H_4\ (g)\ +\ O_2\ (g)\ \rightarrow\ CO_2\ (g)\ +\ H_2O\ (g)$$

a. Write the balanced equation below:

b. How many liters of water can be formed if 1.25 liters of ethylene are consumed in this reaction?

Answer:

c. How many liters of carbon dioxide can be formed if 1.25 liters of ethylene are consumed in this reaction?

Answer:

d. If 35 grams of C_2H_4 is reacted with 20 grams of O_2, how many grams of carbon dioxide will be produced?

Answer:

3) Magnesium metal burns in oxygen to produce magnesium oxide at STP.

$$Mg + O_2 \rightarrow MgO$$

a. Write the balanced equation below:

b. What volume of oxygen would be necessary to burn a 7.43 gram strip of magnesium ribbon?

Answer:

c. How many grams of magnesium oxide are produced when the 7.43 gram strip of magnesium ribbon is burned?

Answer:

4) When coal is burned the sulfur combines with oxygen and the sulfur oxides are released to the atmosphere. Sulfur dioxide (SO_2) becomes sulfur trioxide (SO_3) when reacting with oxygen in the air. This reacts with water molecules in the atmosphere to form sulfuric acid, a strong mineral acid, which makes rain acidic.

$$SO_{2\,(g)} + O_{2(g)} \rightarrow SO_{3\,(g)}$$

a. Write the balanced equation below:

b. If 24.8 L of sulfur dioxide is reacted with oxygen gas, how many grams of sulfur trioxide are produced?

Answer:

c. If 1.37×10^{23} atoms of oxygen (O_2) is consumed, how many molecules of sulfur trioxide are produced?

Answer:

d. If 6.49×10^{24} molecules of sulfur trioxide (SO_3) is produced, how many grams of oxygen was reacted with sulfur dioxide?

Answer: