

CHAPTER 9 REVIEW

Stoichiometry**SECTION 2: Ideal Stoichiometric Calculations**

Please make sure to use correct formulas for the calculations.

1. _____ The following equation represents a laboratory preparation for oxygen gas:
$$2\text{KClO}_3(s) \rightarrow 2\text{KCl}(s) + 3\text{O}_2(g)$$

How many moles of O_2 form if 3.0 mol of KClO_3 are totally consumed?

2. _____ Given the following equation:
$$\text{H}_2(g) + \text{F}_2(g) \rightarrow 2\text{HF}(g)$$

How many grams of HF gas are produced as 5 mol of fluorine react?

3. _____ Water can be made to decompose into its elements by using electricity according to the following equation:
$$2\text{H}_2\text{O}(l) \rightarrow 2\text{H}_2(g) + \text{O}_2(g)$$

How many grams of O_2 are produced when 0.033 mol of water decompose?

4. _____ Sodium metal reacts with water to produce NaOH according to the following equation:
$$2\text{Na}(s) + 2\text{H}_2\text{O}(l) \rightarrow 2\text{NaOH}(aq) + \text{H}_2(g)$$

How many grams of NaOH are produced if 20.0 g of sodium metal react with excess oxygen?

SECTION 2 *continued*

5. _____ a. What mass of oxygen gas is produced if 100. g of lithium perchlorate are heated and allowed to decompose according to the following equation?



- _____ b. The oxygen gas produced in part a has a density of 1.43 g/L. Calculate the volume of this gas.

6. A car air bag requires 70. L of nitrogen gas to inflate properly. The following equation represents the production of nitrogen gas:



- _____ a. The density of nitrogen gas is typically 1.16 g/L at room temperature. Calculate the number of grams of N_2 that are needed to inflate the air bag.

- _____ b. Calculate the number of moles of N_2 that are needed.

- _____ c. Calculate the number of grams of NaN_3 that must be used to generate the amount of N_2 necessary to properly inflate the air bag.