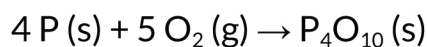


Name : _____ Date : _____

STOICHIOMETRY Worksheet

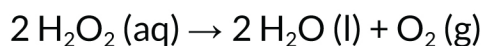
1. Phosphorous burns in oxygen to produce phosphorous oxide in the following reaction:



a. What mass of phosphorous will be needed to produce 3.25 mol of P_4O_{10} ?

b. If 0.489 mol of phosphorous burns, what mass of oxygen is used? What mass of P_4O_{10} is produced?

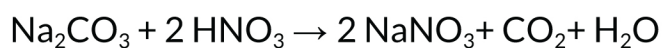
2. Hydrogen peroxide breaks down, releasing oxygen, in the following reaction:



a. What mass of oxygen is produced when 1.840 mol of H_2O_2 decomposes?

b. What mass of water is produced when this reaction produces 5 mol of O_2 ?

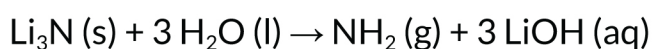
3. Sodium carbonate reacts with nitric acid according to the following equation.



a. How many moles of Na_2CO_2 are required to produce 100 g of NaNO_2 ?

b. If 7.5 g of Na_2CO_3 reacts, how many moles of CO_2 are produced?

4. Consider the following reaction:

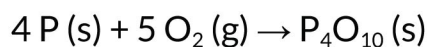


What mass of lithium hydroxide is produced when 0.38 g of lithium nitride reacts?

STOICHIOMETRY Worksheet

Answers

1. Phosphorous burns in oxygen to produce phosphorous oxide in the following reaction:



a. What mass of phosphorous will be needed to produce 3.25 mol of P_4O_{10} ?

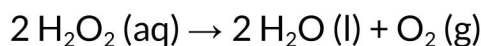
$$3.25 \text{ mol P}_4\text{O}_{10} \times (4 \text{ mol P}/1 \text{ mol P}_4\text{O}_{10}) \times (30.97 \text{ g P}/1 \text{ mol P}) = 403 \text{ g P}$$

b. If 0.489 mol of phosphorous burns, what mass of oxygen is used? What mass of P_4O_{10} is produced?

$$0.489 \text{ mol P} \times (5 \text{ mol O}_2/4 \text{ mol P}) \times (32 \text{ g O}_2/1 \text{ mol O}_2) = 19.6 \text{ g O}_2$$

$$0.489 \text{ mol P} \times (1 \text{ mol P}_4\text{O}_{10}/4 \text{ mol P}) \times (284 \text{ g P}_4\text{O}_{10}/1 \text{ mol P}_4\text{O}_{10}) = 34.72 \text{ g P}_4\text{O}_{10}$$

2. Hydrogen peroxide breaks down, releasing oxygen, in the following reaction:



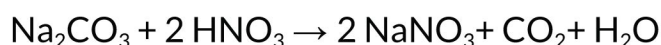
a. What mass of oxygen is produced when 1.840 mol of H_2O_2 decomposes?

$$1.840 \text{ mol H}_2\text{O}_2 \times (1 \text{ mol O}_2/2 \text{ mol H}_2\text{O}_2) \times (32 \text{ g O}_2/ 1 \text{ mol O}_2) = 29.44 \text{ g O}_2$$

b. What mass of water is produced when this reaction produces 5 mol of O_2 ?

$$5 \text{ mol O}_2 \times (2 \text{ mol H}_2\text{O}/ 1 \text{ mol O}_2) \times (18 \text{ g H}_2\text{O}/ 1 \text{ mol H}_2\text{O}) = 180 \text{ g H}_2\text{O}$$

3. Sodium carbonate reacts with nitric acid according to the following equation.



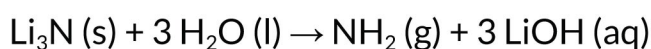
a. How many moles of Na_2CO_3 are required to produce 100 g of NaNO_3 ?

$$100 \text{ g NaNO}_3 \times (1 \text{ mol NaNO}_3/ 85 \text{ g NaNO}_3) \times (1 \text{ mol Na}_2\text{CO}_3/2 \text{ mol NaNO}_3) = 0.588 \text{ mol Na}_2\text{CO}_3$$

b. If 7.5 g of Na_2CO_3 reacts, how many moles of CO_2 are produced?

$$7.5 \text{ g Na}_2\text{CO}_3 \times (1 \text{ mol Na}_2\text{CO}_3/ 106 \text{ g Na}_2\text{CO}_3) \times (1 \text{ mol CO}_2/ 1 \text{ mol Na}_2\text{CO}_3) = 0.071 \text{ mol CO}_2$$

4. Consider the following reaction:



What mass of lithium hydroxide is produced when 0.38 g of lithium nitride reacts?

$$0.38 \text{ g Li}_3\text{N} \times (1 \text{ mol Li}_3\text{N}/34.7 \text{ g Li}_3\text{N}) \times (3 \text{ mol LiOH}/1 \text{ mol Li}_3\text{N}) \times (23.9 \text{ g LiOH}/ 1 \text{ mol LiOH}) = 0.79 \text{ g LiOH}$$