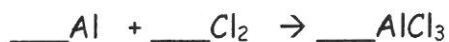


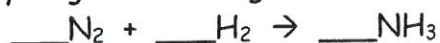
Answer each of the following questions using the equation provided. BE SURE TO BALANCE EACH EQUATION BEFORE SOLVING ANY PROBLEMS. SHOW ALL WORK.

1. In a reaction between the elements aluminum and chlorine, aluminum chloride is produced.



- a. 2 moles of Al will react with \_\_\_\_\_ mole(s) of  $\text{Cl}_2$  to produce \_\_\_\_\_ mole(s) of  $\text{AlCl}_3$ .
- b. How many grams of  $\text{AlCl}_3$  will be produced if 2.50 moles of Al react?
- c. How many moles of  $\text{Cl}_2$  must react to produce 12.3 g of  $\text{AlCl}_3$ ?
- d. How many grams of aluminum will react with 3.4 moles of chlorine?
- e. If 17 grams of aluminum react, how many moles of aluminum chloride will be produced?

2. The ammonia (NH<sub>3</sub>) used to make fertilizers for lawns and gardens is made by reacting nitrogen and hydrogen according to the following reaction.



- a. Determine the mass in grams of NH<sub>3</sub> formed from 1.34 moles of nitrogen.
- b. What is the mass in grams of hydrogen required to react with 1.34 moles of nitrogen?
- c. How many moles of nitrogen are required to produce 11.7 moles of NH<sub>3</sub>?
- d. How many moles of nitrogen are required to produce 11.7 grams of NH<sub>3</sub>?
- e. How many grams of hydrogen are required to form 3.5 moles of NH<sub>3</sub>?

The first step in the industrial manufacture of nitric acid involves the catalytic oxidation of ammonia according to the following BALANCED equation.



How many moles of NO are formed if 824 g of NH<sub>3</sub> react?

How many grams of water are formed if 2.5 moles of ammonia are oxidized?

How many moles of oxygen are needed to react with 4.6 moles of ammonia?

Mercury (II) oxide decomposes into mercury and oxygen gas according to the following UNBALANCED equation.



How many moles of mercury (II) oxide are needed to produce 125 g of oxygen?

How many moles of mercury are produced if 24.5 moles of mercury (II) oxide decompose?

How many grams of oxygen will be produced if 2.3 moles of mercury are produced?