Stoichiometry Practice

(Selected Answers are given in bold)

Mole to Mole Problems
1. \( \text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3 \)
   How many moles of hydrogen are needed to completely react with 2.0 moles of nitrogen?
2. \( 2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2 \)
   How many moles of oxygen are produced by the decomposition of 6.0 moles of potassium chlorate?
3. \( \text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2 \)
   How many moles of hydrogen are produced from the reaction of 3.0 moles of zinc with an excess of hydrochloric acid?
4. \( 2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2 \)
   How many moles of potassium nitrate are produced when 2.0 moles of potassium phosphate react with two moles of aluminum nitrate? 6 moles

Mass to Mass Problems
1. \( 2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2 \)
   How many grams of potassium chloride are produced if 25 g of potassium chlorate decompose?
2. \( 2\text{AgNO}_3 + \text{BaCl}_2 \rightarrow 2\text{AgCl} + \text{Ba(NO}_3)_2 \)
   How many grams of silver chloride are produced from 5.0 g of silver nitrate reacting with barium chloride?
3. \( \text{Sn} + 2\text{HF} \rightarrow \text{SnF}_2 + \text{H}_2 \)
   Tin(II) fluoride, SnF\(_2\), is used in some toothpastes. It is made by the reaction of tin with hydrogen fluoride according to the following equation.
   How many grams of SnF\(_2\) are produced from the reaction of 30 g of HF with Sn? 118 g
6. In a spacecraft, the carbon dioxide exhaled by astronauts can be removed by its reaction with lithium hydroxide, LiOH, according to the following chemical equation.
   \( \text{CO}_2(g) + 2\text{LiOH}(s) \rightarrow \text{Li}_2\text{CO}_3(s) + \text{H}_2\text{O}(l) \)
   If 1.20x10\(^{24}\) molecules of CO\(_2\) is exhaled, the average amount exhaled by a person each day, how much (in grams) Li\(_2\)CO\(_3\) is produced? 148 g
7. When 9.8 g of aluminum oxide decomposes, how many grams of aluminum metal are produced?
   (Hint: You must criss-cross to get the formula for aluminum oxide.) 5.2 g Al
8. How many grams of iodine are produced when 0.72 mol of fluorine react with potassium iodide?
   (Hints: You must criss-cross to get the formula for potassium iodide. Check to see if iodine and fluorine are diatomic. Iodine is not the only product; you must figure the other product out before balancing this equation.) 182.9 g
9. How many grams of sodium are required to react with water to produce 5.0 g of sodium hydroxide? (Unbalanced equation is: Na + H\(_2\)O \rightarrow NaOH + H\(_2\) 2.9 g
10. How many molecules of H\(_2\) are produced in the reaction in #9? 3.76x10\(^{23}\) molecules of H\(_2\)