

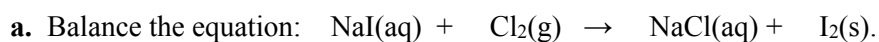
## Stoichiometry Practice Problems

- 1. A piece of magnesium burns in the presence of oxygen, forming magnesium oxide (MgO). How many moles of oxygen are needed to produce 12 moles of magnesium oxide?  $2\text{Mg(s)} + \text{O}_2\text{(g)} \rightarrow 2\text{MgO(s)}$**
  
- 2. The carbon dioxide exhaled by astronauts can be removed from a spacecraft by reacting it with lithium hydroxide (LiOH). The reaction is as follows:  $\text{CO}_2\text{(g)} + 2\text{LiOH(s)} \rightarrow \text{Li}_2\text{CO}_3\text{(s)} + \text{H}_2\text{O(l)}$ . An average person exhales about 20 moles of  $\text{CO}_2$  per day. How many moles of LiOH would be required to maintain two astronauts in a spacecraft for three days?**
  
- 3. Balance the following equation and answer the questions below.  $\text{KClO}_3\text{(s)} \rightarrow \text{KCl(s)} + \text{O}_2\text{(g)}$** 
  - a. How many moles of  $\text{O}_2$  are produced from 10 moles of  $\text{KClO}_3$ ?**
  
  - b. How many moles of KCl are produced using 3 moles of  $\text{KClO}_3$ ?**
  
  - c. How many moles of  $\text{KClO}_3$  are needed to produce 50 moles of  $\text{O}_2$ ?**

4. The following reaction occurs in plants undergoing photosynthesis.  $6\text{CO}_2(\text{g}) + 6\text{H}_2\text{O}(\text{l}) \rightarrow \text{C}_6\text{H}_{12}\text{O}_6(\text{s}) + 6\text{O}_2(\text{g})$   
How many grams of glucose ( $\text{C}_6\text{H}_{12}\text{O}_6$ ) are produced when 24.0 moles of carbon dioxide reacts in excess water?

5. Calculate the mass of sodium chloride ( $\text{NaCl}$ ) produced when 5.50 moles of sodium reacts in excess chlorine gas.

6. How many grams of chlorine gas must be reacted with excess sodium iodide ( $\text{NaI}$ ) to produce 6.00 moles of sodium chloride?



- b. Perform the calculation.

7. Calculate the mass of hydrochloric acid ( $\text{HCl}$ ) needed to react with 5.00 moles of zinc.

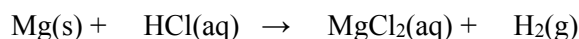


- b. Perform the calculation.

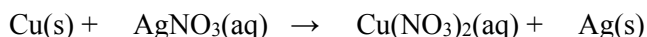
8. How many grams of sodium hydroxide (NaOH) are needed to completely react with 50.0 grams of sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) to form sodium sulfate (Na<sub>2</sub>SO<sub>4</sub>) and water?  $2\text{NaOH}(\text{aq}) + \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{Na}_2\text{SO}_4 + 2\text{H}_2\text{O}(\text{g})$

9. Balance each equation and solve the problem.

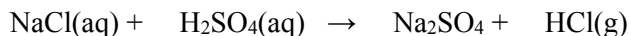
a. If 40.0 g of magnesium reacts with excess hydrochloric acid (HCl), how many grams of magnesium chloride (MgCl<sub>2</sub>) are produced?



b. Determine the mass of copper needed to react completely with a solution containing 12.0 g of silver nitrate (AgNO<sub>3</sub>).



c. How many grams of hydrogen chloride (HCl) are produced when 15.0 g of sodium chloride (NaCl) reacts with excess sulfuric acid (H<sub>2</sub>SO<sub>4</sub>)?



d. Calculate the mass of silver phosphate (Ag<sub>3</sub>PO<sub>4</sub>) produced if 30.0 g of silver acetate (AgCH<sub>3</sub>COO) reacts with excess sodium phosphate (Na<sub>3</sub>PO<sub>4</sub>).

