

## 12

## STOICHIOMETRY

## Practice Problems

In your notebook, solve the following problems.

## SECTION 12.1 THE ARITHMETIC OF EQUATIONS

Use the 3-step problem-solving approach you learned in Chapter 1.

1. An apple pie needs 10 large apples, 2 crusts (top and bottom), and 1 tablespoon of cinnamon. Write a balanced equation that fits this situation. How many apples are needed to make 25 pies?  $10A + 2C + Ci \rightarrow A_{10}C_2Ci$  250

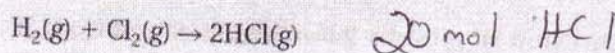
2. Two moles of potassium chloride and three moles of oxygen are produced from the decomposition of two moles of potassium chlorate,  $KClO_3(s)$ . Write the balanced equation. How many moles of oxygen are produced from 12 moles of potassium chlorate?  $2KClO_3(s) \rightarrow 2KCl(s) + 3O_2(g)$  18 mol  $O_2$

3. Using the equation from problem 2, how many moles of oxygen are produced from 14 moles of potassium chlorate? 21 mol  $O_2$

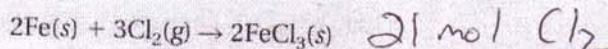
4. Two molecules of hydrogen react with one molecule of oxygen to produce two molecules of water. How many molecules of water are produced from  $2.0 \times 10^{23}$  molecules of oxygen? How many moles of water are produced from 22.5 moles of oxygen?  $2H_2(g) + O_2(g) \rightarrow 2H_2O(g)$   $4.0 \times 10^{23}$  molecules  $H_2O$   
45.0 mol  $H_2O$

## SECTION 12.2 CHEMICAL CALCULATIONS

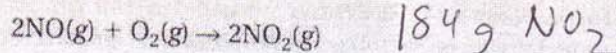
1. Calculate the number of moles of hydrogen chloride produced from 10 moles of hydrogen.



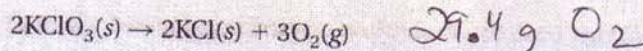
2. Calculate the number of moles of chlorine needed to form 14 moles of iron(III) chloride.



3. Calculate the number of grams of nitrogen dioxide that are produced from 4 moles of nitric oxide.

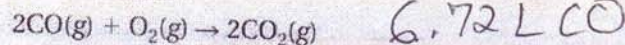


4. Calculate the mass of oxygen produced from the decomposition of 75.0 g of potassium chlorate.



5. Calculate the mass of silver needed to react with chlorine to produce 84 g of silver chloride. (Hint: Write a balanced equation first.) 63 g Ag

6. How many liters of carbon monoxide at STP are needed to react with 4.80 g of oxygen gas to produce carbon dioxide?  $2Ag(s) + Cl_2(g) \rightarrow 2AgCl(s)$



7. Calculate the number of liters of oxygen gas needed to produce 15.0 liters of dinitrogen trioxide. Assume all gases are at the same conditions of temperature and pressure.

