

## Gas Stoichiometry

Chem Worksheet 14-5

Name \_\_\_\_\_

Use your knowledge of *Stoichiometry* and the *Ideal Gas Law* to solve the following problems. The chemical equations given are all balanced.

- What volume of  $O_2$  is produced when 28.5 g of hydrogen peroxide ( $H_2O_2$ ) decomposes to form water and oxygen at  $150^\circ C$  and 2.0 atm?  
 $2H_2O_2 (aq) \rightarrow 2H_2O (l) + O_2 (g)$
- This reaction uses 18.2 g of copper (I) sulfide ( $Cu_2S$ ). What volume of sulfur dioxide gas would be collected at  $237^\circ C$  and 10.7 atm?  
 $2Cu_2S (s) + 3O_2 (g) \rightarrow 2Cu_2O (s) + 2SO_2 (g)$
- When 62.7-g nitrogen and excess oxygen react they generate nitrogen dioxide. If the  $NO_2$  is collected at 625 K and 0.724 atm, what volume will it occupy?  
 $N_2 (g) + 2O_2 (g) \rightarrow 2NO_2 (g)$
- What volume of hydrogen gas is evolved from a reaction between 0.52 g of Na and water? The gas is collected at  $20.^\circ C$  and 745 mmHg.  
 $2Na (s) + 2H_2O (l) \rightarrow 2NaOH (aq) + H_2 (g)$
- At what pressure is the nitrogen gas sample that is collected when 48.4 g of  $NaN_3$  decomposes? The temperature of the gas is  $25^\circ C$  and the volume is 18.4 L.  
 $2NaN_3 (s) \rightarrow 2Na (s) + 3N_2 (g)$
- When 2.4-g zinc is added to hydrochloric acid, 450 mL of hydrogen gas forms at a temperature of  $32^\circ C$ . What is the pressure of the gas?  
 $Zn (s) + 2HCl (aq) \rightarrow ZnCl_2 (aq) + H_2 (g)$
- The following reaction forms 6.41 L of oxygen at a temperature of  $18.7^\circ C$  and a pressure of 731 torr, what mass of  $KClO_3$  must have decomposed?  
 $2KClO_3 (s) \rightarrow 2KCl (s) + 3O_2 (g)$
- What mass of  $CaSO_3$  must have been present initially to produce 14.5 L of  $SO_2$  gas at a temperature of  $12.5^\circ C$  and a pressure of 1.10 atm?  
 $CaSO_3 (s) \rightarrow CaO (s) + SO_2 (g)$