

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?
 $CaSO_3 (s) \rightarrow CaO (s) + SO_2 (g)$