Worksheet: Gas laws

MULTIPLE CHOICE.

1) A balloon is filled with helium gas at 1.50 atm and has a volume of 300 mL. To squeeze the balloon to 200 mL volume at the same temperature, the pressure will have to be
A) 1.00 atm  B) 1.50 atm  C) 2.25 atm  D) none of the above

1) C

PROBLEMS. Show work with proper Significant Figures and Units to receive credit.

2) Determine the density of carbon dioxide gas at STP (in g/L).

ANS: 1.96 g/L

3) What is the volume of 1.24 grams of chlorine gas at STP?

ANS: 0.392 L

4) In a cold winter morning the tire in Dr. Eddie’s car was at 20.0 L and 2.00 atm at 4°C. By noon, the pressure of the tire became 2.10 atm at 26°C. Calculate the volume of air in the tire at noon.

ANS: 20.6 L

5) Calculate the pressure, in atmosphere, of 0.200 grams of oxygen gas in a 1.00-L container at a temperature of 25°C.

ANS: 0.153 atm

6) A sample of HBr gas has a volume of 4.52 L at a pressure of 760 mm Hg and a temperature of 25°C. What is the temperature of this sample at P = 1000 mm Hg and V = 2.00 L?

ANS: 174 K

7) In a chemistry lab, hydrogen gas can be conveniently generated using the following reaction:
   2 Al + 3H2SO4 → Al2(SO4)3 + 3 H2

   If 1.00 g of aluminum foil is mixed with 12.0 g sulfuric acid,

   A. Calculate the number of moles of hydrogen gas (hint: first find the limiting reagent)

   ANS: 0.0556 mol

   B. Calculate the volume of hydrogen gas at 25°C and 751 mmHg from your answer to A.

   ANS: 1.38 L