GAS LAWS PART III

NAME _____ SECTION _____

1. Calculate the volume of a sample of helium at −33.0 °C and 1.23 atm if it occupies a volume of 2.34 L at 54.5 °C and 1026 mmHg.

2. A 0.751 mol sample of an ideal gas occupies a 10.0 liter flask at 27.0 °C and 1.85 atm. If 0.257 mol of the gas are removed from the container, calculate the new pressure. (Assume the temperature remains constant.)

3. What is the volume of a bulb that contains 3.56 g of nitrogen gas at 25.0 °C and 3.50 atm?

4. Calculate the density of SF_6 at 1.00 atm and 0.00 °C.

5. Consider the reaction

$$2\ NaOH(s) + CO_2(g) \rightarrow Na_2CO_3(s) + H_2O(l)$$

which is a chemical means, although not economically viable, of removing CO_2 from the atmosphere. How many liters of CO_2 at 25.0 °C and 745 mmHg can be removed by 1.00 kg of NaOH?

6. Calculate the total pressure in a 10.0 liter flask at 21 °C which contains 4.00 g H_2, 12.0 g O_2, and 8.00 g He.

7. A common laboratory preparation of O_2 involved the decomposition of hydrogen peroxide, H_2O_2, according to the equation:

$$2\ H_2O_2(aq) \rightarrow 2\ H_2O(l) + O_2(g)$$

If 240 mL of O_2 at 23 °C and at 0.965 atm pressure are collected over a sample of water at the same temperature, determine the number of moles of O_2 obtained in the reaction.