Constants & Equations:

$$P = g \times h \times d$$

$$R = 0.08206 \frac{L \cdot atm}{mol \cdot K}$$

$$d \int_{L}^{g} = \frac{M_{wt} \cdot P}{R \cdot T}$$

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

$$1 \text{ mole} = 22.4 \text{ L (at STP)}$$

1. Calculate the height in meters of a column of liquid glycerol (density = 1.26 g/cm<sup>3</sup>) required to exert the same pressure as 760 mmHg (d= 13.60 g/cm<sup>3</sup>).

2. To what volume will a sample of gas expand if it heated from 50.0°C and 2.33 L to 500.0°C?

3. A balloon filled with helium gas at  $20^{\circ}$ C occupies 4.91 L at 1.00 atm. The balloon is immersed in liquid nitrogen at -196°C, while the pressure is raised to 5.20 atm. What is the volume of the balloon in the liquid nitrogen?

4. A 0.465 g sample of an unknown compound occupies 245 mL at 298 K and 1.22 atm. What is the molar mass of the unknown compound?

5. Potassium chlorate decomposed upon heating to form potassium chloride and oxygen. Determine the volume of  $O_2$  (at STP) formed when 50.0 g of potassium chlorate (122.55 g/mol) decomposes.

6. A 34.8 mL sample of an unknown, water-insoluble gas was collected over water at 22.6°C and a barometric pressure of 0.895 atm. When the gas was dried and chilled, it formed 114.6 mg of liquid. What was the molar mass of this substance? [The vapor pressure of water at 22.6°C is 20.mmHg]