1) A block of aluminum occupies a volume of 15.0 mL and weighs 40.5 g. What is its density?

2) Mercury metal is poured into a graduated cylinder that holds exactly 22.5 mL. The mercury used to fill the cylinder weighs 306.0 g. From this information, calculate the density of mercury.

2b) What will be the mass of 18 mL of mercury?

2c) What will be the volume of 45g of mercury?

3) What is the mass of the ethyl alcohol that exactly fills a 200.0 mL container? The density of ethyl alcohol is 0.789 g/mL

An ideal gas satisfies the equation PV=nRT, where P is the pressure in atm, V is the volume in liters, T is the temperature in degrees kelvin, n is the number of moles, and R is a constant (Google "ideal gas law" to look it up).

4. a. Solve the ideal gas law for P

b. Solve for T

5. Imagine that you are warming a sealed flexible Balloon (n and P constant) from 300 K to 350 K (must be in Kelvin to work with this formula). The initial volume of the balloon is 0.32 L, what is the new volume of the balloon?

6. In a sealed box with constant volume, when is the temperature is 285K, the pressure is 1 atm. What is the pressure when the temperature is raised to 350K

7. In calculating equilibrium in a chemical reaction, several givens are substituted into the formula

$K_c = \frac{[HI]^2}{[H_2][I_2]}$ to get $54.3 = \frac{(2x)^2}{(0.100-x)(0.250-x)}$. Solve for x.

Answers: 1. $2.7\frac{g}{ml}$

2 a. $13.6\frac{g}{ml}$

b. $244.8g$

c. $3.3ml$

3. $157.8\,g$

4. a. $P = \frac{nRT}{V}$

b. $T = \frac{PV}{nR}$

5. 0.37 L

6. 1.23 atm.

7. x=0.282 and x=.096