MIXED GAS LAWS WORKSHEET

Directions: Examine each question and then **write the form of the gas law you plan to use to** solve each question. Show which values you have, which values are missing and/or which values need to be calculated. Be careful to use standard units of volume (liters), temperature (Kelvins) & pressure (atm or mm of Hg).

1. A gas occupies 3.5L at 2.5 mm Hg pressure. What is the volume at 10 mm Hg at the same temperature?

   Form => $P_1V_1 = P_2V_2$
   So (2.5mm Hg)(3.5 L) = (10mm Hg)(V) now solve for V

2. A constant volume of oxygen is heated from 100°C to 185°C. The initial pressure is 4.1 atm. What is the final pressure?

3. A sample of 25L of NH_3 gas at 10°C is heated at constant pressure until it fills a volume of 50L. What is the new temperature in °C?

4. A 600mL balloon is filled with helium at 700mm Hg barometric pressure. The balloon is released and climbs to an altitude where the barometric pressure is 400mm Hg. What will the volume of the balloon be if, during the ascent, the temperature drops from 24 to 5°C?

5. An unknown gas has a volume of 200L at 5 atm and -140°C. What is its volume at STP (standard temp = 273K, standard pressure = 1 atm) ?

6. In an autoclave, a constant amount of steam is generated at a constant volume. Under 1.00 atm pressure the steam temperature is 100°C. What pressure setting should be used to obtain a 165°C steam temperature for the sterilization of surgical instruments?

7. Explain what each of the following changes would do to the pressure in a closed container (increase or decrease pressure).

   A) Part of the gas is removed

   B) The container size (volume) is decreased

   C) Temperature is increased.

8. Name the 5 postulates of the Kinetic Molecular Theory

9. Which gas will effuse faster, neon or carbon dioxide? Why?

10. If a pressure is at 932 mm Hg, what is the amount in atm?

11. If a pressure is at 367.5 mm Hg, what is the amount in torr?

12. If a pressure is at 4.2 atm, what is the amount in mm Hg?

13. A metal tank contains three gases: oxygen, helium, and nitrogen. If the partial pressures of the three gases in the tank are 35 atm of O_2, 5 atm of N_2, and 25 atm of He, what is the total pressure inside of the tank?

14. Blast furnaces give off many unpleasant and unhealthy gases. If the total air pressure is 0.99 atm, the partial pressure of carbon dioxide is 0.05 atm, and the partial pressure of hydrogen sulfide is 0.02 atm, what is the partial pressure of the remaining air?

15. What is a barometer used for? Explain how it works. Draw a picture if necessary

16. As pressure increases, temperature _____.

17. As temperature increases, volume _____.

18. As volume decreases, pressure _____.

19. What does STP mean? What are the STP conditions?