Dougherty Valley HS Chemistry
Gas Laws – Extra Practice Up Through Partial Pressure

Worksheet #6*

Name: **Period:**   **Seat#:**

Directions: Any worksheet that is labeled with an * means it is suggested extra practice. We do not always have time to assign every possible worksheet that would be good practice for you to do. You can do this worksheet when you have extra time, when you finish something early, or to help you study for a quiz or a test. If and when you choose to do this Extra Practice worksheet, please do the work on binder paper. You will include this paper stapled into your Rainbow Packet when you turn it in, even if you didn't do any of this. We want to make sure we keep it where it belongs so you can do it later if you want to (or need to). If you did the work on binder paper you can include that in your Rainbow Packet after this worksheet. If we end up with extra class time then portions of this may turn into required work. If that happens you will be told which problems are turned into required. Remember there is tons of other extra practice on the class website…and the entire internet! See me if you need help finding practice on a topic you are struggling with.

- **Show work for ANY math problem.**
- **Include ALL units.**
- **Some answers provided at the end of the question. The answers are underlined.**

1) A container holds three gases: oxygen, carbon dioxide, and helium. The partial pressures of the three gases are 2.00 atm, 3.00 atm, and 4.00 atm, respectively. What is the total pressure inside the container? _9.00atm._

2) A container with two gases, helium and argon, is 30.0% by volume helium. Calculate the partial pressure of helium and argon if the total pressure inside the container is 4.00 atm. _2.8 atm_

3) If 60.0 L of nitrogen is collected over water at 40.0 °C when the atmospheric pressure is 760.0 mm Hg, what is the partial pressure of the nitrogen? _705 mmHg_

4) 80.0 liters of oxygen is collected over water at 50.0 °C. The atmospheric pressure in the room is 96.00 kPa. What is the partial pressure of the oxygen? _83.7 kPa_

5) A tank contains 480.0 grams of oxygen and 80.00 grams of helium at a total pressure of 7.00 atmospheres. Calculate the following.
     a. How many moles of O_2 are in the tank? _15 mol_
     b. How many moles of He are in the tank? _20 mol_
     c. Total moles of gas in tank. _35 mol_
     d. Mole fraction of O_2.
     e. Mole fraction of He.
     f. Partial pressure of O_2. _3.0002 atm_
     g. Partial pressure of He. _3.9998 atm_

6) A tank contains 5.00 moles of O_2, 3.00 moles of neon, 6.00 moles of H_2S, and 4.00 moles of argon at a total pressure of 1620.0 mm Hg. Complete the following table

	O_2	Ne	H_2S	Ar	Total
Moles	5	3	6	4	18.00
Mole fraction					1
Pressure fraction	0.278	0.167	0.333	0.222	1
Partial Pressure					1620.0

7) A mixture of 14.0 grams of hydrogen, 84.0 grams of nitrogen, and 2.0 moles of oxygen are placed in a flask. When the partial pressure of the oxygen is 78.00 mm of mercury, what is the total pressure in the flask? _468 mmHg_

8) A flask contains 2.00 moles of nitrogen and 2.00 moles of helium. How many grams of argon must be pumped into the flask in order to make the partial pressure of argon twice that of helium?

9) A mixture of neon and argon gases exerts a total pressure of 2.39 atm. The partial pressure of the neon alone is 1.84 atm, what is the partial pressure of the argon? *0.55 atm*

10) A 450 cm^3 sample of hydrogen is collect over water at 12°C. The pressure of the hydrogen and water vapor mixture is 78.5 kPa. What is the partial pressure of the dry hydrogen gas? *77.1 kPa*

11) 888 cm^3 of oxygen are collected over water with a temperature of 27°C. The total pressure of the gases is 55.8 kPa. What is the partial pressure of the dry gas? *52.2 kPa*

12) What is the total pressure of a mixture of gases made up of CO_2, O_2 and H_2 if the partial pressures are 22.3 kPa, 44.7 kPa and 112 kPa respectively?

13) A quantity of Helium is collected over water at 70 °C, and the mixture has a pressure of 89.9 kPa. What is the partial pressure of the water vapor?

14) A sample of hydrogen is collected by displacing a sample of water with a temperature of 35 °C. The mixture has a total pressure of 114 kPa. What is the partial pressure of the dry hydrogen?

15) When nitrogen is prepared and collected over water at 30°C and a total pressure of 784.2 torr, what is its partial pressure (in torr)?

16) Air is composed of several gases. The partial pressure of Nitrogen is 593.4 mm Hg. The partial pressure of Argon is 7.07 mm Hg. The other gases, besides oxygen, total 0.31 mm Hg. What is the partial pressure of oxygen at mean sea level?

17) A volume of 546 mL of hydrogen is collected over water at 30°C when the atmospheric pressure is 100.45 kPa. How many moles of hydrogen are present?

18) In an experiment, a student collects 107 mL of H_2 over water at a pressure of 104.8 kPa and a temperature of 31°C. How many grams of H_2 are present?

19) At an atmospheric pressure of 2 atm and a temperature of 300K, a chemist collects 1.6 L of hydrogen over water. How many moles did the chemist collect?

20) What is the value of and units on R? What is R called ("A letter" is not the correct answer!)?

21) A 50.00 liter tank at minus 15.00 °C contains 14.00 grams of helium gas and 10.00 grams of nitrogen gas.
        a. Determine the moles of helium gas in the tank.
        b. Determine the moles of nitrogen gas in the tank.
        c. Determine the mole fraction of helium gas in the tank.
        d. Determine the mole fraction of nitrogen gas in the tank.
        e. Determine the partial pressure of helium gas in the tank.
        f. Determine the partial pressure of nitrogen gas in the tank.
        g. Determine the total pressure of the mixture in the tank.
        h. Determine the volume that the mixture will occupy at STP.

Combined Gas Law Problems which also require Dalton's Law also. *Remember:* A gas collected over water is always considered to be saturated with water vapor. The vapor pressure of water varies with temperature and must be looked up in a chart (You should have one in your reference section, and you can find the charts online too).

22) 690.0 mL of oxygen are collected over water at 26.0 °C and a total pressure of 725.0 mm of mercury. What is the volume of dry oxygen at 52.0 °C and 800.0 mm pressure?

23) 400.0 mL of hydrogen are collected over water at 18.0 °C and a total pressure of 740.0 mm of mercury.

24) What is the partial pressure of H_2?

25) What is the partial pressure of H_2O?

26) What is the volume of DRY hydrogen at STP?

27) 45.0 mL of wet argon gas is collected at 729.3 mm Hg and 25.0 °C. What would be the volume of this dry gas at standard conditions?

28) 19.1 L of He gas is collected over water at 681.3 mm Hg and 18.5 °C. What would be the volume of this dry gas at standard conditions?

29) 407 mL of H_2 gas is collected over water at 785.3 mm Hg and 23.5 °C. What would be the volume of this dry gas at standard conditions?

30) 93.0 mL of O_2 gas is collected over water at 0.930 atm and 10.0 °C. What would be the volume of this dry gas at standard conditions?

31) 6.12 L of wet xenon gas is collected at 2.00 x 10^5 Pa and 80.0 °C. What would be the volume of this dry gas at standard conditions?

32) A sample of oxygen collected over water when the atmospheric pressure was 1.002 atm and the room temperature,

33) 25.5 °C occupied 105.8 mL. What would be the volume of this dry gas at standard conditions?

34) 1.000 L of hydrogen gas is collected over water at 30.0 °C at a pressure of 831.8 mm Hg. Find the volume of dry hydrogen collected at STP.

35) 50.6 mL of a gas is collected over water at 18.0 °C and 755.5 mm Hg pressure. What is the volume of dry gas at STP?