**Chemistry – Chapter 14 Study Guide**

1. Describe the general properties of gases.

2. What 3 factors affect gas pressure?

3. Know the SI unit for pressure and force. Be able to convert between units of pressure (mmHg, kPa and atm)

1. \_\_\_\_\_\_\_\_\_\_atm = \_\_\_\_\_\_\_\_\_mmHg = \_\_\_\_\_\_\_\_\_\_\_kPa

4. Know what STP means and what values are assigned with STP.

5. When dealing with temperature and gas law you must always convert Celsius to \_\_\_\_\_\_\_\_\_. Know the conversion to do so.

6. State Boyle’s Law. Use it to solve problems involving pressure and volume. Know what variable must be held constant in Boyle’s Law.

1. If 2.5L of a gas at 110.0kPa is expanded to 4.0L at constant temperature and pressure, what is the new pressure?
2. If 650 mL of hydrogen is stored in a cylinder with a moveable piston at 225kPa and

the pressure is increased to 545kPa at constant temperature, what is the new volume?

7. State Charles’ Law. Use it to solve problems involving temperature and volume. Know what variable is held constant in Charles’ Law.

1. A balloon filled with a volume of 15.5L is inflated in a room at 20.0°C and then taken

outside where the temperature is 7.0°C, what will be the new volume of the balloon if the pressure remains constant?

1. The volume of gas in a syringe is 15.0mL at 23.5°C. What will the volume of the gas be at 72.5°C if the pressure is held constant?

8. State Gay Lussac’s Law. Use it to solve problems involving pressure and temperature. Know what variable is held constant in Gay Lussac’s Law.

Gay Lussac’s Law continued…practice problems

1. The pressure in a tire is 101kPa at 10.0°C, what will the pressure of the tire be at 45.0°C?
2. The pressure in a bottle of soda pop is 505kPa at 20.0⁰C. What is the new pressure if someone warms the sealed bottle to 65.0⁰C?

9. State the Combined Gas Law. Use it to solve problems involving pressure, temperature and volume.

1. Calculate the final pressure of a gas initially at 122kPa pressure that is expanded from 4.50L at 56⁰C to 18.0L at 124⁰C.
2. A weather balloon has a volume of 3.5kL at 1.01atm and 18⁰C. What is the balloon’s volume at a pressure of 0.420atm and -18⁰C?

10. What is the ideal gas law? Be able to solve problems using it.

* 1. How many moles of gas are in a balloon that has a volume of 15.9L at a pressure of 149kPa and a temperature of 28°C?
  2. How many moles of ammonia, NH3, is required to fill a 14.88L bottle to a pressure of 199kPa at 25°C?
  3. What is the volume of 4.35 moles of a gas at a pressure of 85.6kPa and 26.0°C?

10. Explain diffusion and effusion.

12. What is Graham’s Law of diffusion? Explain why Helium would effuse faster than Nitrogen at the same temperature.

13. What is partial pressure? Explain Dalton’s Law of Partial Pressure.

**Answers to problems:**

6a. 69kPa

6b. 268mL

6c. decrease to 1/3 of original value

7a. 14.8L

7b. 17.5mL

8a. 113kPa

8b. 583kPa

9a. 36.8kPa

9b. 7.4kPa

10a. 0.947mol

10b. 1.20mol NH3

10c. 126L