Chemistry
Gas Laws WS 2

I. *Answer the following questions using Gay-Lussac's Law, showing all work and circling your answer:*

1. A steel container filled with H_2 gas is at a pressure of 6.5 atm and a temperature of 22°C. If the container is placed near a furnace and is heated to a temperature of 50°C, what would be the new pressure in the container?

2. A sample of carbon monoxide gas at standard temperature and pressure is present in a 30.4 L rigid container. What will be the pressure of the gas in kPa if the temperature is increased by 62°C?

3. A sample of nitrogen gas (N_2) in a rigid 73.0 L container at a temperature of –32°C exerts a pressure of 1.90 atm. Calculate the pressure of the gas when the temperature is increased to 32°C.

4. The gas left in a used aerosol can is at STP. If this can is thrown onto a fire, what is the internal pressure of the gas when its temperature reaches 945°C?

5. The pressure of nitrogen gas at 35°C is changed from 0.89 atm to 4.3 atm. What will be its final temperature in °C?

6. A gas with a pressure of 133 kPa is cooled to –33.0°C and a new pressure of 53.3 kPa. What was the original temperature of the gas in °C?

II. *Answer the following questions using the Combined Gas Law, showing all work and circling your answer:*

7. A 42.0 L cylinder is heated from 170. K to 503 K. If the pressure inside increases from 50.0 kPa to 127 kPa, causing a piston to move, what is the final volume of the cylinder?

8. A gas at 150 kPa and 35.0°C occupies a volume of 6.85 L. Calculate its volume at STP.

9. The pressure of a gas inside a container is tripled while its temperature increases from 280 K to 350 K. What is the container's final volume if its initial volume was 2.4 L?

10. Five liters of air at –50°C are warmed to 100°C. What is the new volume if the pressure is also doubled?

11. A sample of oxygen gas has a volume of 205 L when its temperature is 22.0°C and its pressure is 30.8 kPa. What volume will the gas occupy at STP?

12. A gas-filled balloon having a volume of 2.50 L at 1.20 atm and 25°C is allowed to rise high above the Earth's surface, where the temperature is –23°C and the pressure is 3.0×10^{-3} atm. What is the final volume of the balloon?

13. A 3.50 L gas sample at 20°C and a pressure of 650 mm Hg is allowed to expand to a volume of 8.00 L. What is the final temperature of the gas (in degrees Celsius) if the final pressure of the gas is 425 mm Hg?