Name _____ Date _____ Period_____

Unit 8 Gas Laws Vocabulary C405 Chemistry

Part I Matching: Write the letter of the description that best matches each term.

_____ 1. Boyle's law

_____ 2. combined gas law

_____ 3. absolute zero

_____ 4. Charles's law

_____ 5. Gay-Lussac's law

a. The volume of a fixed mass of gas is directly proportional to its Kelvin temperature if the pressure is kept constant.

b. The pressure of a gas is directly proportional to the Kelvin temperature if the volume remains constant.

c. For a fixed mass of gas at constant temperature, the volume of gas varies inversely with pressure.

d. $\frac{P_1 x V_1}{T_1} = \frac{P_2 x V_2}{T_2}$

e. -273.15 ºC

Part II Fill in the Blank

The pressure and volume of a fixed mass of gas are __6__ related. If one decreases, the other __7__ . This relationship is known as __8__ law. The volume of a fixed __9__ of a gas is directly related to its __10__ temperature. This relationship is known as __11__ law. __12__ law states that the pressure of a gas is __13__ proportional to the Kelvin temperature if the volume remains constant.

These three separate gas laws can be written as a single expression called the __14__ gas law. It can be used in situations in which none of the variables are constant.

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

13. _____

14. _____

Part III - Are the following statements <u>always true</u> (AT), <u>sometimes true</u> (ST), or <u>never true</u> (NT)?

_____ 15. According to the combined gas law, $T_2 = P_1 x \frac{V_2 x T_1}{P_2 x V_1}$

_____ 16. According to Boyle's law, when the volume of a gas at constant temperature increases from V_1 to V_2, the pressure decreases from P_1 to P_2.

_____ 17. A balloon with a volume of 60 L at 100 kPa pressure will expand to a volume of 120 L at a pressure of 50 kPa.

_____ 18. At 0 °C the average kinetic energy of gas particles is theoretically zero.

_____ 19. When using the combined gas law, pressure must always be in units of kPa but temperature can be in kelvins or degrees Celsius.

_____ 20. When 20.0 L of O_2 is warmed from -30.0 °C to 85.0 °C at constant pressure, the new volume is 29.5 L.

Part IV Questions and Problems

21. A rigid container holds a gas at a pressure of 55 kPa and a temperature of -100.0 °C. What will the pressure be when the temperature is increased to 200.0 °C?

22. What is the volume of a sample of CO_2 at STP that has a volume of 75.0 mL at 30.0 °C and 91 kPa?