

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

## Gas Ws #4: Ideal Gas Law

Show all your work on separate paper. Circle your final answer with the correct units!

$$PV=nRT \quad \text{Temperature must be in Kelvin}$$

$$R= 8.31 \text{ (L kPa)/(mol K)}$$

$$R=0.0821 \text{ (L atm)/(mol K)}$$

1. What is the pressure in atmospheres exerted by a 0.500 mole sample of nitrogen gas in a 10.0L container at 25.0°C?
2. What is the volume, in liters, of 0.250 mole of oxygen gas at 20.0°C and 0.974 atm of pressure?
3. What mass of chlorine gas,  $\text{Cl}_2$ , in grams, is contained in a 10.0L tank at 27.0°C and 3.50 atm of pressure?
4. An engineer pumps 5.00 moles of carbon monoxide gas into a cylinder that has a capacity of 20.0 L. What is the pressure in kPa of CO inside the cylinder at 25.0°C?
5. A student collects 425 ml of oxygen at a temperature of 24.0°C and a pressure of 0.899 atm. How many moles of oxygen did the student collect?
6. Determine the molar mass of an unknown gas that has a volume of 72.5 ml at a temperature of 68.0°C, and a pressure of 0.980 atm, and a mass of 0.207 g.
7. A sample of an unknown gas has a mass of 0.116g. It occupies a volume of 25.0 mL at a temperature of 127°C and has a pressure of 155.3kPa. Calculate the molar mass of the gas.
8. Determine the mass of  $\text{CO}_2$  gas that has a volume of 7.10 L at a pressure of 1.11 atm and a temperature of 31.0°C.
9. What pressure in atmospheres will 1.36 kg of  $\text{N}_2\text{O}$  gas exert when it is compressed in a 25.0 L cylinder and its stored in an outdoor shed where the temperature reaches 59.0°C during the summer?
10. A large balloon contains 11.7 g of helium. What volume will the helium occupy at an altitude of  $1.00 \times 10^4$  meters, where the atmospheric pressure is 0.262 atm and the temperature is -50.0°C?
11. The density of dry air at 27.0°C and 100.0 kPa is 1.162 g/L. Use this information to calculate the molar mass of air.