NAME _____ DATE _____

Gas Law Problems

Practice Problems (Level 1)

1. A dry gas occupies a volume of 28.4 mL at 725 torr. What will be the volume of this gas at 800. torr?

2. A dry gas with a volume of 588.8 mL at a pressure of 1.00049 atm is subjected to a new pressure of 1.035 atm. What is its volume under the new pressure?

3. A dry gas occupies a volume of 35. 9 mL at a temperature of 22.0°C. What volume will the same gas occupy at a temperature of 28.0°C?

4. At a temperature of 24.46°C, a dry gas occupies a volume of 4.588 mL. What volume will the gas occupy at a temperature of 21.24°C?

5. At a pressure of 780. mm and 24.2°C, a certain gas has a volume of 350.0 mL. What will be the volume of this gas under standard conditions?

6. A dry gas at a temperature of 67.5°C and a pressure of 882 torr occupies a volume of 242.2 mL. What will be the volume of the gas at a new pressure of 840. torr and 80.0°C?

7. A sample of gas containing 0.089 mol is put into a 10.00 L container at a temperature of 30.0°C. What pressure does the gas exert on the container?

8. How many moles of gas are contained in a 50.0 L cylinder at a pressure of 100.0 atm and a temperature of 35°C?

9. What is the relative rate of diffusion between two samples of oxygen and hydrogen gas?

10. A sample of gas consists of 75% hydrogen and 25% oxygen. The total pressure exerted by the gas is 788 torr. What pressure is exerted by each of the gases individually?

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Gas Law Problems

Practice Problems (Level 2)

1. A gas occupies a volume of 34.2 mL at a temperature of 15.0°C and a pressure of 800.0 torr. What will be the volume of this gas at standard conditions?

2. At conditions of 785 torr of pressure and 15.0°C temperature, a gas occupies a volume of 45.5 mL. What will be the volume of the same gas at 745 torr and 30.0°C?

3. A dry gas has a volume of 100.0 mL at a pressure of 1600. torr. At what pressure would this volume be reduced to 50.0 mL?

4. A dry gas at a temperature of 18.0°C has a volume of 40.0 mL. What temperature change is needed to reduce this volume to 35.0 mL?

5. 40.0 mL of gas is collected over water on a day when the barometric pressure was 790.0 torr and the temperature 20.0°C. What would be the volume of this (dry) gas at standard conditions?

6. A sample of oxygen collected over water when the atmospheric pressure was 1.002 atm and the room temperature, 25.5°C occupied 105.8 mL. What would be the volume of this dry gas at standard conditions?

7. What is the relative rate of diffusion of two gases whose densities are 1.33×10^{-3} and 1.165×10^{-3} g/cm^3?

8. Find the density of a gas which diffuses at a rate 1.16 times greater than that of one with a density of 1.78×10^{-3} g/cm^3.

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Gas Law Problems

Practice Problems (Level 3)

1.14 atm 1. A gas collected on a day when the atmospheric pressure was 1.12 atm had a volume of 252.4 mL. A day later, that volume had changed to 248.8 mL. What was the atmospheric pressure on the second day?

.5 ml 2. The volume of a dry gas originally at standard temperature and pressure was recorded as 488.8 mL. What volume would the same gas occupy when subjected to a pressure of 100. atm and temperature of -245°C?

1.25 g/l 3. Calculate the density of carbon monoxide gas at standard conditions if 25.0 mL of the gas weighs 0.0329 g at 800.00 mm of pressure.

.0897 g/ml 4. The weight of 15.0 mL of gas at 5.00 atm of pressure and a temperature of 53.0°C is 8.35×10^{-3} g. What is the density of this gas under standard conditions?

6.47 ml 5. A sample of gas occupying 5.000 mL is collected over water at a pressure of 1.35 atm and a temperature of 10.5°C. What volume would the gas occupy at standard conditions?

19 g 6. What weight of oxygen gas is contained in a 3.50 L tank where the temperature is 50.0°C and the pressure maintained at 4.5 atm?

2.0 g/mole 7. Calculate the molecular weight of a gas if 35.44 g of the gas stored in a 7.50 L tank exerts a pressure of 60.0 atm at a constant temperature of 35.5°C.

711 torr H_2 28 torr O_2 28 torr N_2 8. What pressure will be exerted by each of the gases in the following mixture if the total pressure of the mixture amounts to 768.8 torr? 0.500 g of hydrogen; 0.245 g of oxygen; 0.335 g of nitrogen.

410 torr CO_2 141 torr CO 219 torr NH_3 9. A mixture of gases containing equal weights of carbon dioxide, carbon monoxide, and ammonia exerts an overall pressure of 450.0 torr. What pressure is exerted by each gas individually?

57.3 10. The relative rate of diffusion between two gases is 1.89. If the lighter gas is methane (mw = 16), what is the molecular weight of the other gas?