

## Worksheet #C54: Gas Laws Summary

Directions: Show all your set-ups and remember sig figs and units.

STP = 0°C, 1.00 atm, 760. torr  
760 mm Hg, 101.325 kPa

R = .0821  $\frac{\text{atm L}}{\text{mole K}}$

1. A sample of oxygen gas occupies a volume of 675. mL at 784 torr. What volume will it occupy at .876 atm?

a. \_\_\_\_\_ What formula will you use?

b. \_\_\_\_\_ Answer

2. What is the pressure in a 767 mL flask containing 458 grams of N<sub>2</sub> gas at 44°C?

a. \_\_\_\_\_ What formula will you use?

b. \_\_\_\_\_ Answer

3. Oxygen gas is at a temperature of 37° C when it occupies a volume of 10.9 liters. To what temperature should it be raised to occupy a volume of 22.7 liters?

a. \_\_\_\_\_ What formula will you use?

b. \_\_\_\_\_ Answer

4. You start out with 3.25 L of pure neon gas at STP and you double both the pressure and the volume. What will the gas's final temperature be (in both °C and K)?

a. \_\_\_\_\_ What formula will you use?

b. \_\_\_\_\_ K \_\_\_\_\_ °C Answer

5. Hydrogen gas was cooled from 15 °C to -55. °C. Its new volume is 14.8 mL. What was its original volume?

a. \_\_\_\_\_ What formula will you use?

b. \_\_\_\_\_ Answer

6. If you start out with some chlorine gas at 2.55 atm and -15°C, then change the conditions to 33°C and 133 kPa, the new volume is 375 mL. What was the chlorine's original volume?

a. \_\_\_\_\_ What formula will you use?

b. \_\_\_\_\_ Answer

7. A sample of carbon dioxide occupies a volume of 2.22 liters at .975 kPa. What pressure would the gas exert if the volume was increased to 2.95 liters?

a. \_\_\_\_\_ What formula will you use?

b. \_\_\_\_\_ Answer

8. What mass (in grams) of helium gas is needed to fill a 10.0 L tank to a pressure of 825 torr at 37°C?

a. \_\_\_\_\_ What formula will you use?

b. \_\_\_\_\_ Answer

9. What would be the total pressure of a container that is holding  $\text{NH}_3(\text{g})$  with a pressure of .623 atm,  $\text{NO}_2(\text{g})$  with a pressure of 144 torr, and  $\text{NO}(\text{g})$  with a pressure of 4.44 psi? (Answer in atm.)

a. \_\_\_\_\_ What formula will you use?

b. \_\_\_\_\_ Answer

10. What is the mole fraction of each of the gases in problem # 9?

a. \_\_\_\_\_ What formula will you use?

b.  $\text{NH}_3(\text{g}) =$  \_\_\_\_\_ Answer

$\text{NO}_2(\text{g}) =$  \_\_\_\_\_ Answer

$\text{NO}(\text{g}) =$  \_\_\_\_\_ Answer

11. A container is holding 4.59 moles  $\text{O}_2(\text{g})$  , 7.99 moles  $\text{CH}_4(\text{g})$ , and 2.77 moles  $\text{Cl}_2(\text{g})$ . The total pressure of the container is 955 torr. What is the partial pressure of each of the gases?

a. \_\_\_\_\_ What formula will you use?

b.  $\text{O}_2(\text{g}) =$  \_\_\_\_\_ Answer

$\text{CH}_4(\text{g}) =$  \_\_\_\_\_ Answer

$\text{Cl}_2(\text{g}) =$  \_\_\_\_\_ Answer