

## Guided Notes: Combined Gas Law Notes

Name: \_\_\_\_\_ Pd.: \_\_\_\_\_

- What are the names of the three laws that are combined for the combined gas law?
  - 1.
  - 2.
  - 3.

- Write the equation for the combined gas law in the box below”

- What is the initial condition? \_\_\_\_\_
- What is the final condition? \_\_\_\_\_
- Temperature is **measured** in \_\_\_\_\_.
- Temperature is **calculated** in \_\_\_\_\_.
- $K =$  \_\_\_\_\_

### Combined Gas Law Problems:

1. A bread bag is inflated to a volume of 3.89 L at 111 kPa and 23°C. If the volume drops to 3.05 L at a temp. of 4 °C, what is the new pressure? (Show all the work)

- Make sure you cross multiply!

2. A volume of gas starts at 350 mL, 298 K, and 1.5 atm. What is the new volume in mL if the temperature decreases to 255 K and the pressure drops to 750 mm Hg? (Show all the work)
  - What do we need to do with the pressures?

- What should we always watch for in these problems?

### Check for Understanding:

If a 3.5 L balloon is at STP and the pressure is increased to 1.25 atm and the volume decreases to 3.0 L, what is the new temperature?

## Molar Volume (Avogadro's Principle) Notes

- Avogadro's principle states:
- The molar volume of a gas is \_\_\_\_\_
- The conditions for STP: \_\_\_\_\_ atm and \_\_\_\_\_ °C
- Write the conversion factor used for Avogadro's principle in the box below:

- The conversion factor is referred to as \_\_\_\_\_.
  - What can the conversion factor be used in?
1. Calculate the volume of 0.881 mole of gas at STP. (Show all the work)
    - What can we use as long as we are at STP?
  2. Calculate the volume that 2.0 kg CH<sub>4</sub> will occupy at STP. (Show all the work)
  3. How many moles of gas are contained in 37.86 L of gas at STP?( show all the work)
  4. How many grams of nitrogen are present in 16.34 L at STP? (Show all the work)
    - Why did we use N<sub>2</sub> in this problem and not just N?

### Check for Understanding:

Calculate the volume of 4.76 g oxygen present at STP.