

Gas Law Review 2

Solve the following problems based upon the indicated changes:

Remember that Temperature has to be in degrees Kelvin.

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

$$PV = nRT$$

$$R = 8.31 \frac{\text{L}\cdot\text{kPa}}{\text{mol}\cdot\text{K}}$$

- 350.0 ml of N_2 gas at 70.0°C is heated to 400.0 K at a constant pressure.
 - What is the new volume of the gas in ml?
 - What is the volume in liters?
- 465 L of O_2 gas at 800.0 mmHg of pressure is exposed to a 50.0 mmHg increase in pressure.
 - What is the final pressure in mmHg?
 - What is the new volume in liters if the temperature remains constant?
- A sample of CO_2 gas that occupied 12.6 cm^3 at a temperature of 250.0 K and a pressure of 99.8 kPa now has a temperature of 0.00°C and a volume of 32.0 ml.
 - What is the new pressure in kPa?
 - What is the new pressure in mmHg?
- A sample of neon starting at 300.0 K and 140.0 kPa is cooled to 250.0 K and its pressure drops by 14.0 kPa
 - What is the final pressure?
 - If the ending volume of the gas was 233 ml, what was the starting volume of the gas?
- If 0.360 moles of helium is at 22.0°C and 660.0 mmHg, what is its volume?
- If 2.00 L of water vapor is at a temperature of 400.0 K and a pressure of 740.0 kPa, how many moles of gas are present?
- A gas is originally at 46.0°C and has a volume of 350.0 ml. Assuming there is no pressure change, and the ending volume is 385 ml,
 - Did the gas heat up or cool off?
 - What is the final temperature in Kelvin?
 - What is this temperature in Celsius?
- If 3.50 L of methane gas at 1.05 atm of pressure is reduced in volume to 2.90 L while the temperature is held constant:
 - Did the pressure have to go up or down?
 - What is the new pressure in atmospheres?
 - What is the new pressure in kPa?

9. If 2.00 moles of chlorine gas is at STP:
- What is the formula for chlorine gas?
 - How many grams of chlorine is this?
 - What is the volume of the gas in liters?
10. A sample of gas at STP has a volume of 145 cm^3 . If the final temperature of the gas is 42.0°C and the ending volume is 135 ml, what is the pressure of the gas in mmHg?
11. You have a 40 g sample of helium (He) at 23°C and a pressure of 99.8 kPa,
- How many moles of He is this?
 - What is the volume of the He?
12. Suppose you are trying to get a gas to expand as much as you possible could...what would you do to the:
- Temperature?
 - Pressure?