

Test Review – Gas Laws

1. A 3.10 mL bubble of methane gas forms at the bottom of a bog where the temperature is 12°C and the pressure is 8.5 atm. The bubble rises to the surface where the temperature is 35°C and the pressure is 1.18 atm. What is the new volume of the methane bubble?
2. A 0.456 g sample of a carbon dioxide gas sample occupies 160. mL at 22°C . What is the pressure in atm and in torr of this sample of gas?
3. How much pressure would you need to exert on a sample of helium at 150 KPa to compress it from 420. mL to 100. mL at constant temperature?
4. A sample of hydrogen gas at STP has a volume of 3.5×10^3 L. What will be the new volume of this gas when the temperature drops to -70°C while the pressure remains constant?
5. A gas is under 680. torr of pressure at a temperature of 39°C in a steel container. What is the new temperature in K and $^{\circ}\text{C}$ when the pressure drops to 620. torr in the same container.
6. If 45.0 g of propane (C_3H_8) burns completely. How many L of carbon dioxide gas will be released if the system is at STP?
7. If 125 g of propane is burned completely at 202.6 KPa of pressure and 32°C , then how many L of carbon dioxide gas will be released? (same equation as #6)
8. A gas that effuses 1.19 times slower than nitrogen is added to light bulbs. What is the molecular mass of this unknown gas?
9. a) Find the partial pressure of a sample of oxygen gas collected over water when the temperature is 10.0°C .
The total pressure is 750. mmHg. The vapor pressure of water is 9.209 mmHg at 10.0°C .
b) How many grams of O_2 gas are in the 275 mL container at 10.0°C ?
10. What is the density of NO_2 gas under 1.20 atm of pressure and 29.0°C of temperature?
11. What is the molecular weight of a gas that has a density of 3.74 g/L at STP.
12. The following molecules are in closed containers at 35.4°C . The molecules of which gas have the greatest average kinetic energy? NH_3 , Cl_2 , O_2 , CH_4
13. The following gases are in closed containers at 15.0°C . The molecules of which gas move with the greatest average velocity? CH_4 , Br_2 , CO_2 , SO_2
14. Find the relative rate of diffusion for the gases sulfur dioxide and ammonia (NH_3). Explain your answer.
15. Compare the rates of diffusion of He and N_2 . Explain your answer.
16. Oxygen diffuses 2.00 times faster than gas X. What is the molar mass of gas X?