CH 7: Worksheet Name:

CHM 102

1. Boyles Law: holding temperature constant
   1. A 2.3 L sample of N2 gas exerts a pressure of 5.6 atm. What is the pressure ( in atm) if the volume is decreased to 1.8 L?

P2 = P1V1/V2 P2 = 7.2 atm

* 1. A 0.872 L sample of O2 gas exerts a pressure of 456.22 mm Hg. What is the volume (in L) if the pressure is increased to 682.1 mm Hg?

V2 = P1V1/P2 V2 = .583 L

1. Charles Law: holding pressure constant
   1. A 567 L sample of argon gas is heated from 35°C to 65°C. What is the new volume (in L)?

V2 = V1T2/T1 V2 =622 L

* 1. A 0.289 L sample of Cl2 gas at 25°C is compressed to 0.154 L. What is the new temperature (in °C)?

T2 = V2T1/V1 T2 = -114°C

1. Gay-Lussac’s Law: holding volume constant
   1. An iron container of O2 gas at 0.542 atm is heated from 56°C to 78°C. What is the new pressure (in atm)?

P2 = P1T2/T1 P2 = .578 atm

* 1. A container of NO2 gas at 145 mm Hg and 78°C is pressurized to 268 mm Hg. What is the new temperature (in °C)?

T2 = P2T1/P1 T2 = 649 K = 376°C

1. Combined Gas Law
   1. A 12.3 L sample of Ar gas at 25°C has a pressure of 0.435 atm. The volume is allowed to expand to 45.2 L at 25°C. What is the new pressure (in atm)?

P2 = P1V1T2 / T1V2 P2 = .118 atm

* 1. A 5.52 L sample of Ne gas at 65°C has a pressure of 3.54 atm. The temperature is raised to 154°C and the pressure increases to 5.24 atm. What is the new volume (in L)?

V2 = P1V1T2 / T1P2 V2 = 4.71 L

* 1. A 0.0275 L sample of CO2 gas at 15°C has a pressure of 0.246 atm. The pressure is increased to 0.627 atm, while the volume decreases to 0.0149 L . What is the new temperature (in °C)?

T2 = P2V2T1 / P1V1 T2 = 398 K = 125°C

1. Ideal Gas Law
   1. How many moles of CO gas are in a 23 L sample of CO gas at 146°C and a pressure of 2.68 atm?

Remember to change °C 🡪 K

n = PV/RT = 1.79 mole CO

* 1. What is the temperature of a 4.68 L sample of 2.56 mole H2O gas at a pressure of 0.894 atm?

T = PV/nR = 19.91 K

* 1. What is the volume of a 1.56 mole sample of Helium gas at 345°C and 5.62 atm?

V = nRT/P = 14.1 L

* 1. What is the pressure of a 0.0825 L sample of 1.76 mole SO2 gas at 84°C?

P = nRT/V = 625 atm