**The Magic of Gas Laws**

*R = 0.08206 Latm/molK*

1) How many moles of CH4 are present in a 2.0 liter bottle at a temperature of 25 degrees Celsius and a pressure of 1.2 atm?

2) If I have 25 grams of carbon dioxide in a 35 L container at a temperature of 80 degrees Celsius, what is the pressure inside this container?

3) If I have a 2.0 L balloon at a pressure of 1.0 atm and then pull it underwater where the pressure is 1.3 atm, what is the new volume of the balloon?

4) If the temperature of the balloon in problem 3 is 30 degrees Celsius, how many moles of nitrogen gas (N2) does it hold?

5) If a SCUBA store caught fire and a 200 L air tank with constant volume and a pressure of 35 atm was heated from 298 to 800 K, what would be the new pressure inside of the tank?

**The Magic of Gas Laws Key**

*R = 0.08206 Latm/molK*

1) How many moles of CH4 are present in a 2.0 liter bottle at a temperature of 25 degrees Celsius and a pressure of 1.2 atm?

0.098 moles

2) If I have 25 grams of carbon dioxide in a 35 L container at a temperature of 80 degrees Celsius, what is the pressure inside this container?

0.47 mol

3) If I have a 2.0 L balloon at a pressure of 1.0 atm and then pull it underwater where the pressure is 1.3 atm, what is the new volume of the balloon?

1.5 L

4) If the temperature of the balloon in problem 3 is 30 degrees Celsius, how many moles of nitrogen gas (N2) does it hold?

0.060 mol

5) If a SCUBA store caught fire and a 200 L air tank with constant volume and a pressure of 35 atm was heated from 298 to 800 K, what would be the new pressure inside of the tank?

94 atm (note: the volume doesn’t change, so we can ignore it)