The Gas Laws

Boyle's law involves initial pressure (P_1) and initial volume (V_1), as well as final pressure (P_2) and final volume (V_2) at constant temperature. In equation form, the relationship is expressed as

$$\frac{P_1}{P_2} = \frac{V_2}{V_1} \quad \text{or} \quad P_1 V_1 = P_2 V_2$$

Apply this concept to the following problem.

A liter (1000 cm^3) of gas is under a pressure of 80.00 cm of mercury. What pressure is needed in order to reduce the original volume of the gas to 600.0 cm^3?

What is the initial/beginning pressure P_1

What is the finial/ending pressure P_2 ?

What is the intial/beginning volume V_1

What is the finial/ending volume V_2

Now substitute the variables (one of them is unknown) cross multiply and divide.

answer 2 decimals

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

Charles's law involves initial volume (V_1) and initial temperature (T_1), as well as finial volume (V_2) and final temperature (T_2) at constant pressure. Temperature is express in degrees Kelvin (°K). Kelvin is a temperature scale also know as the Absolute scale. In the equation form, the relationship is express as:

Apply this concept to the following problem. $\frac{V_1}{T_1} = \frac{V_2}{T_2}$ or $V_1 T_2 = V_2 T_1$

At **275 °K**, and air-filled balloon has a **volume of 200 liters**. If the pressure of the air remains constant, **what will its volume be** at **300°K**?

What is the initial/beginning volume V_1

What is the initial/beginning temperature T_1

What is the final/ending volume V_2 ?

What is the final/ending temperature T_2

Substitute the variables (one of them is unknown) cross multiply and divide.

$$\frac{V1}{T1} = \frac{V2}{T2}$$

answer 2 decimals

A tube has gas within it **the volume of the gas is 250 liters** the **temperature is 300°K**. If the pressure of the gas is kept constant, **what will the temperature be** if the gas **volume is increased by 50 liters**?

What is the initial/beginning volume V_1

What is the initial/beginning temperature T_1

What is the final/ending volume V_2

What is the final/ending temperature T_2 ?

Substitute the variables (one of them is unknown) cross multiply and divide.

$$\frac{V1}{T1} = \frac{V2}{T2}$$

answer no decimals