Free essay about physics

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Lab Experiment 2: The Pressure Law

Introduction:

The Pressure Law is essential to know characteristics of gases. This law relates pressure of the gas with the absolute temperature of the gas. In this lab report Pressure law has been discussed with an experiment carried out in laboratory. Purpose of this experiment was to measure the number of moles (n) of air enclosed in a tube using the pressure law and to measure the absolute zero of temperature.

Theory:

Pressure P of a given amount of gas (n moles) is directly proportional to its absolute temperature when volume remains a constant.

The universal gas law is $PV = nRT$

So, $P = nR. T/V$. (1)

As $T = $ to $C + 273$, above equation can be written as

$P = nR.(t+273)/V$

$P = nR. t/V + 273nR/V$ .. (2)

Procedure:

A rigid spherical container was used and n moles of air were enclosed in this container so that its volume was constant throughout the experiment. The container was immersed in a water bath in order to vary the temperature of the air inside. The pressure of the air inside was read from a pressure gauge attached to the container. Methodology of the experiment was described as follows-

At first the spherical container was immersed in ice and a thermometer was set up by its side so that temperature and pressure readings could be taken simultaneously. To begin with, the pressure was measured corresponding to a temperature of 0° C. Then the ice was heated to melt and the temperature was increased. The pressure was measured for every 10 degree rise in temperature.

Experimental data and data analysis:

The inner diameter of the spherical container = 2. 2 cm. = 0. 022 m.

So, volume of air inside, V = 4/3 x 3. 14 x 0. 011 ^3 = 0. 0000056 m3