



Medical Physics

Boyle's Law

Experiment Four

Asst. Lect. Leal Abdullah Hamza

leal.abdullah@mustaqbal-college.edu.iq

2020-2021

Purpose:

To measure the pressure of the atmosphere.

Apparatus:

Glass tube-containing mercury and ruler.

Theory:

Boyle's law states that at constant temperature the pressure P of the gas times volume V will remain constant

$$PV = \text{constant}$$

Method:

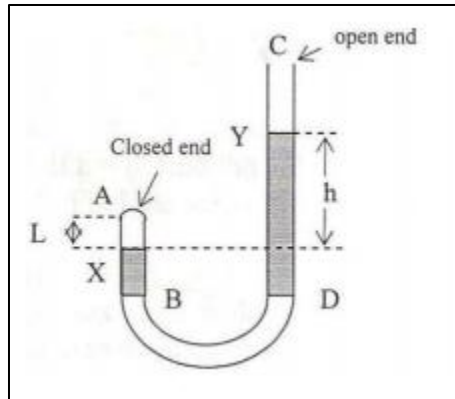
1. Keep the mercury levels X and Y in the same position.

Record the scale reading of these levels and also the scale.

Reading of "A" the inside of the closed end of the tube "AB". This is balance point " $X = Y$ "

2. Rising the tube CD above "balance point" and record the scale reading of X and Y levels.

3. Take about five sets of reading over the balance point.

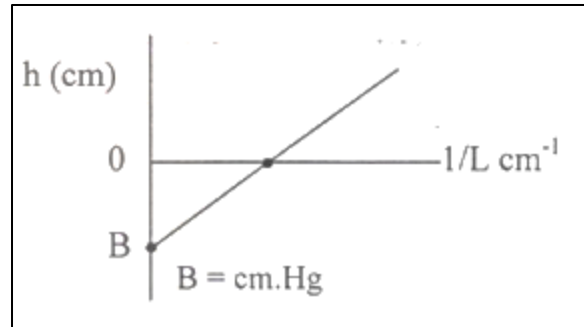


Readings

1. Make the following table.

A-X = L (cm) (closed)	= L (cm)	1/L (cm⁻¹)	Y-X = h (cm) (opened)	h (cm)
40-26.8	13.2	0.075	31-26.8	4.2
40-27.5	12.5	0.08	35.3-27.5	7.8
40-28	12	0.083	39.8-28	11.8
40-28.5	11.5	0.086	44.5-28.5	16
40-29	11	0.09	48.8-29	19.8

2. Plot a graph for the values of h "cm" as ordinates against the corresponding values of 1/ L.



We use the relation to find $1/L$

$$h = \frac{c}{k} \times \left(\frac{1}{L}\right) - B$$

h : the difference between the liquid level in both branches.

From the graph; $h=0$

c , k : constant.

B : represent the atmospheric pressure.