

Boyle's Law of Gases



General Aim

Verification of Boyle's law

Method

J- shaped tube method

Learning Objectives (LOs)

- Explain the relation between the pressure exerted on an ideal gas and the volume it occupies at constant temperature.
- Set Up an experiment to study the pressure-volume relation for an ideal gas.

Theoretical Background/Context

-Now consider the J-tube shown in Figure (1). If mercury is poured into this tube from its open end, a certain quantity of air is trapped in the closed tube.

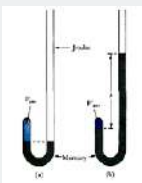


Fig 1.

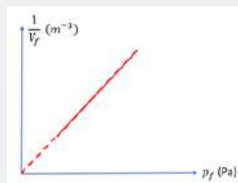


Fig 2.

Theoretical Background/Context (Cont')

- If we raise the open-end tube, the pressure on the trapped air increases by the amount made by the excess mercury in the open tube.
- Now if we plot a graphical relation between the $1/V_f$ on the vertical axis vs p_f on the horizontal axis, we should get a straight line as that shown in Figure (2). Hence, Boyle's law is verified.

Principle of Work

Study the change in volume occupied by a gas when the pressure exerted on it changes at constant temperature.