

EXPERIMENT NO-3

AIM: To trace the path of a ray of light passing through a rectangular glass slab for different angles of incidence, and to measure the angle of incidence, angle of refraction, angle of emergence. Interpret the result.

APPARATUS

Glass slab, Drawing board, sheets of white paper, drawing pins, and protractor.

THEORY

Glass is optically denser than air. So when a ray of light enters a glass slab, it bends towards normal and when it emerges out of the glass slab into the air, it bends away from the normal. The path of a ray of light passing through a rectangular glass slab is shown in the figure. Ray AB is incident ray, BC is refracted ray and CD is emergent ray.

PROCEDURE

A plain sheet was fixed on a drawing board with the help of drawing pins.

A rectangular glass slab was placed in the middle of the paper and its boundary was drawn with a sharp pencil.

Two pins were fixed along straight line AB.

It was looked through the other side of the glass slab and two more pins P3 and P4 were fixed.

All the pins were in a straight line when looked through the glass slab.

After removing glass slab positions of pins were marked.

Points P1 and P2 were joined and the line was extended to meet one face of the slab.

Similarly, the line was extended by joining the points P3 and P4 to meet the other face of the slab (Point C).

Points B and C were also joined.

Perpendicular to the two faces of the slab at point B and point C was drawn.

The angle of incidence, angle of refraction and angle of emergence were recorded in tabular form.

An experiment was repeated for different angles of incidence and corresponding angles of refraction and emergence were determined.

PRECAUTIONS

The pins should be fixed vertically with their feet in a straight line.

The angles of incidence should lie between 30° to 60° .

The location of the pins should be marked correctly.

Observations and Calculations

S.No. The angle of incidence i Angle of refraction r Angle of emergence e $r=e$

- 1.
- 2.
- 3.
- 4.