

METER BRIDGE- RESISTANCE OF GIVEN WIRE

Aim: To determine the resistance of the given wire using meter bridge and hence determine the resistivity of the material of the wire

Apparatus: Meter Bridge, experimental wire, battery, plug key, resistance box, jockey and pointer galvanometer.

Principle:

A meter bridge works on the principle of balanced Whetstone's bridge. The Wheatstone bridge is said to be balanced when the current through the galvanometer is zero.

Formula:

Resistance of the wire

$$R = \frac{Sl}{100 - l} \Omega$$

Where:

S- Standard resistance.

l – Balancing length.

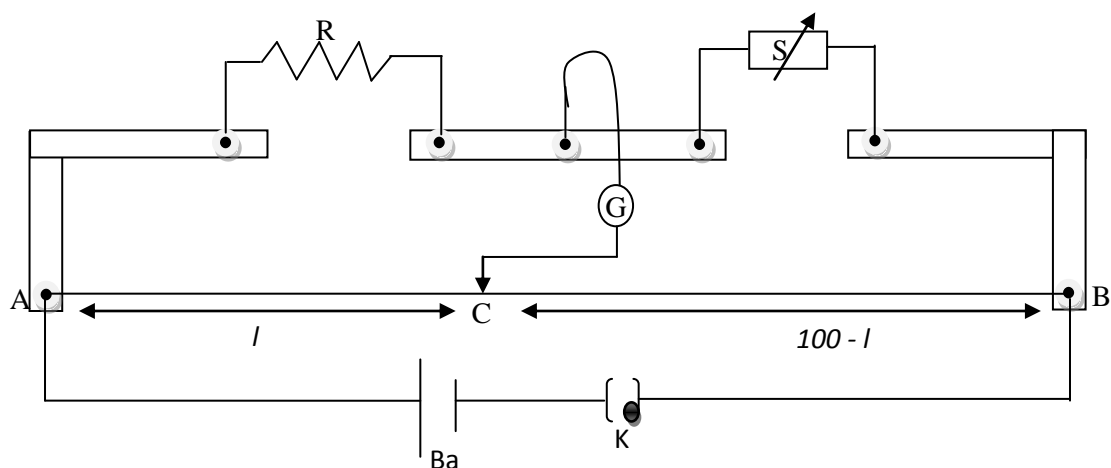
L – Length of the experimental wire.

r – Radius of the experimental wire.

Procedure:

1. The connections are made as shown in the circuit diagram.
2. A suitable resistance S is unplugged in the standard resistance box.
3. The circuit is checked for opposite deflections by placing jockey at the two ends of the wire AB alternately.
4. The jockey is moved on the wire from the end A towards B till the galvanometer shows zero deflection.
5. The balancing length l is measured. The resistance of the wire is calculated using the formula $R = \frac{Sl}{100-l}$
6. The experiment is repeated for different values of S and average value of R is found.
7. The length and radius of the experimental wire is measured using meter scale and screw gauge respectively.

Circuit Diagram:



Where: AB – Meter bridge wire, Ba – Battery, K – Plug key, S – Standard resistance box,
R – Resistance of given wire, C- Balancing Point, G- Pointer galvanometer, AC –
Balancing length

Observations:

Length of the given wire (L) =cm

Radius of the given wire (r) = cm

To Measure the resistance of the given wire:

S.No	Resistance S in Ω	Balancing length l in cm	$R = \frac{Sl}{100 - l}$ in Ω
1			
2			
3			

Mean R = Ω

Result:

The resistance of the given wire is Ω

PRECAUTIONS:

1. The connections should be neat, clean and tight.
2. All the plugs in the resistance box should be tight.
3. Move the jockey gently over the bridge wire and do not rub it.
4. The plug in key K should be inserted only when the observation to be taken.

Source of error:

1. Connections may be loose.
2. The wire may not have uniform thickness.