



Thought-provoking practical physics workshop

فکر انگیز عملی طبیعیات

Lesson: Ohm's Law

Ohm's law states that the potential difference across a resistor is directly proportional to the current flowing through it. However, this law holds only under certain assumptions, one of them being that the physical conditions of the resistor do not change. This means that Ohm's law is not applicable on a metallic conductor with variable temperature.

Objectives

Ohm's law does not hold in certain scenarios. One such scenario is a tungsten filament bulb having a variable voltage supply. Apart from other parameters, the resistance of a tungsten filament depends upon its temperature.

How to conduct the experiment

Apparatus: Bulb, AC voltage regulator, AC ammeter, AC voltmeter

In this experiment, we will investigate a scenario in which Ohm's law does not apparently hold. We will measure values of the RMS current flowing through the bulb at different known voltages. We will then use MS Excel to analyze the data collected from the experiment.

Exploration Points

1. Does this circuit exhibit hysteresis? If yes, identify and justify the cause.
2. Use a light bulb of a different resistance and investigate the change.
- 3.
- 4.

Safety

Be cautious of the hot surfaces and the metallic contacts in-circuit with the 220V mains.