

Lab. No. 1

OHM'S LAW

Earth sciences & petroleum

4th Year – 1st Semester

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Objectives

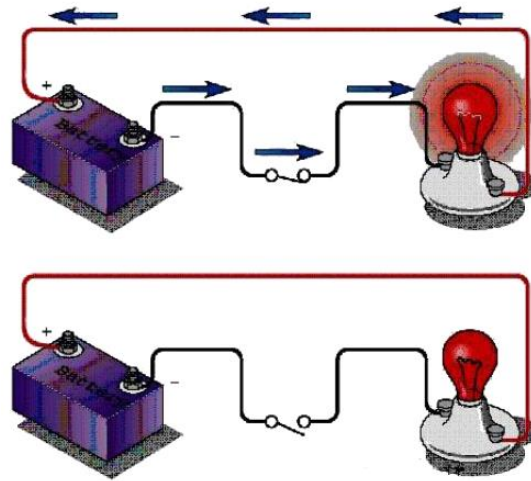
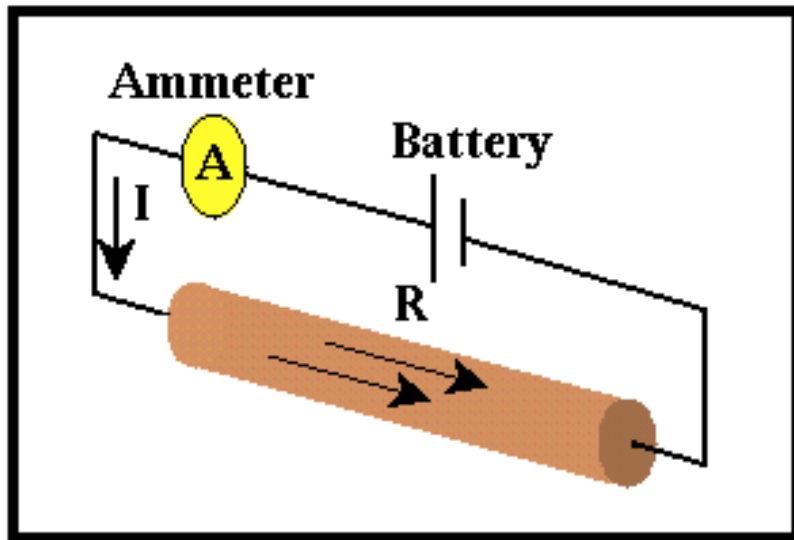
- In this experiment we want to verify Ohm's law by proving that the relation between the current in the circuit and the resistance is a linear relation.

Equipment's

- Resistance
- Ammeter
- Conducting wires
- Voltage source

Ohm's Law

Ohm's Law (discovered in 1827)



Georg Simon Ohm
(1787-1854)

$$V = IR$$

Ohm's law is usually written as:

$$\text{voltage} = \text{current} \times \text{resistance}$$
$$V = I \times R$$

This formula can also be written as:

$$\text{resistance} = \frac{\text{voltage}}{\text{current}}$$
$$R = \frac{V}{I}$$

What are the units of voltage, current and resistance?

- Voltage is measured in **volts** (V).
- Current is measured in **amps** (A).
- Resistance is measured in **ohms** (Ω).

Steps

- Then we will measure the current in the circuit, it will be zero as we didn't turn on the voltage source yet.
- Then we will turn on the voltage source which connected to the circuit shown in previous figure, we will set it to supply the circuit with (2v), and we will measure the current in the circuit.
- We will set the voltage source supply the circuit with (4,6,8,10v) and we will measure the current in each case.
- We will note the measures we took and draw the graph between the voltage and the current.
- Then we will calculate the slope of the graph it should equal the value of resistance we measured in the first step.

Exercise I

- In the test above find out the resistance and proof that there is a linear relation between current and voltage in the circuit?

V (Volt)	I (Ampere)
0	0
2	3
4	5.84
6	8.87
8	11.73
10	14.69

Exercise II

- A portable heater with a resistance of $10\ \Omega$ is plugged into a 120-volt electrical outlet. How much current will flow to the heater?

Lab. No. 2

Apparent resistivity

Thank you