

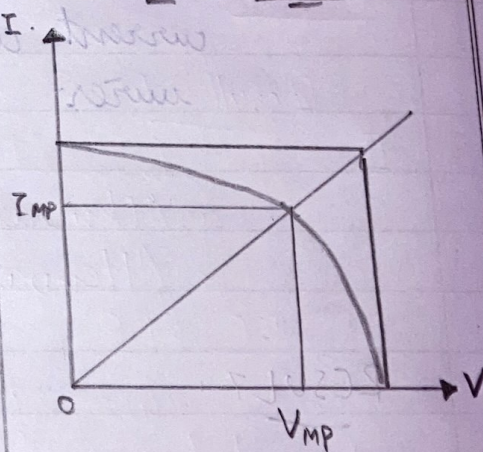
Photo-Voltaic Cell.

Schematic Representation of circuit of solar cell.

OBSERVATION TABLE →

MODEL GRAPH

Intensity	Resistance (ohm)	Voltmeter Reading (V)	Ammeter Reading
Maximum	10	1.57	122.6
	22	2.83	122.1
	47	3.62	74.1
	56	3.63	63.3
	68	3.84	55.2
	82	3.9	45.5
	100	3.93	36.2
	160	3.94	26.2
	180	3.96	21.6



DETERMINATION OF EFFICIENCY OF A SOLAR CELL

AIM:-

To determine the efficiency of the solar cell

APPARATUS REQUIRED →

solar cell, voltmeter, milliammeter, a dial type resistance box, keys, illuminating lamps, connecting wires, etc.

FORMULAE :

$$\text{Efficiency of solar cell } (\eta) = \left[\frac{P_{\max}}{A I_0} \right] \times 100$$

P_{\max} = Max power = $I_{mp} \times V_{mp}$ Watts

A - Area of the solar cell $[7.2 \text{ cm} \times 4.5 \text{ cm}]$

I_0 → Intensity of light = Power of the bulb / $4\pi d^2$

d → distance b/w solar panel and the bulb.



Experiment

Name

CALCULATIONS →

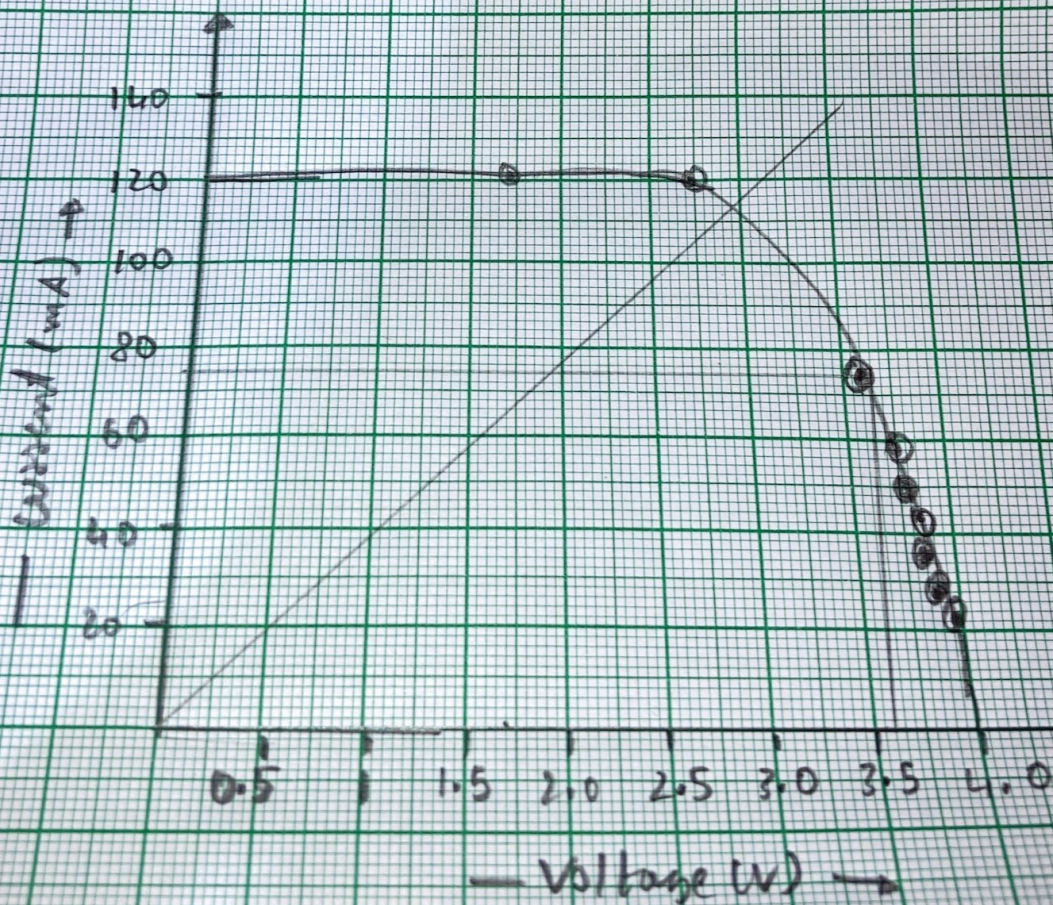
$$\text{Maximum Power} = 0.62 \times 3.58 \\ = 3.06$$

$$\text{Intensity of light } (P_0) = \frac{75}{4 \times 3.14 \times 10}$$

$$\text{Area of the solar panel} = 7.2 \text{ cm} \times 4.5 \text{ cm} = 32.4 \text{ cm}^2$$

$$\text{Efficiency of the cell } (\eta) = \frac{P_{\text{max}}}{A I_0} \times 100$$

$$= \frac{0.306}{32.4 \times 0.0599} \times 100 = 15.74\%$$

GRAPH →

OBSERVATION →

Power of the bulb = 75W.

Distance between solar panel & bulb = 10cm.

Maximum Power P_{\max} = 3.06 W

Intensity of light I_0 = 0.059

Area of the solar panel = 32.4 cm²

RESULT →

The efficiency of the solar panel is $\eta' = 15.74\%$