



Applied Physics for Scientists and Engineers

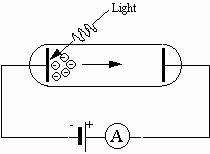
# Lab Report 6: To Study Variation of Photoelectric

**Effect Current with Intensity of Incident Light**

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| --- | --- | --- |
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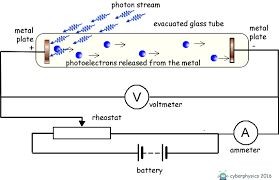
# Changing Photoelectric Current With Light intensity:



**Apparatus:**

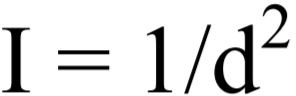
1. Voltmeter.
2. Micrometer
3. Power Supply
4. Meter Rod
5. Photoelectric Effect.

# Diagram:



**Procedure:**

* 1. Light from a source falls on the metal surface at some particular distance measured with a meter rod.
  2. Electrons emitted from the metal surfaces due to incident beam are called photons and currently produced due to photons is called photoelectric.
  3. The microammeter will show the little current readings and deflection.
  4. The circuit figure show cathode and anode. The diode tube cathode is connected to the negative terminal of the battery.
  5. The microammeter is connected in series with the circuit.
  6. The light from the source is incident on the cathode in a bulb.
  7. If we increase or decrease the distance between the bulb and cathode, the microammeter will show the deflection.
  8. The intensity of the beam depends upon the distance of the source from the tube.



* 1. The voltage is changed from different values and the graph is plotted.

# Readings:

For voltage V=50 volts

|  |  |  |  |
| --- | --- | --- | --- |
| Distance (cm) | Angle (dA) | D\*2 | I=1/d\*2 |
| 50 | 2.5 | 2500 | 0.0004 A |
| 40 | 2 | 1600 | 0.000625 A |
| 30 | 3 | 900 | 0.00111 A |
| 20 | 6 | 400 | 0.0025 A |
| 10 | 22 | 100 | 0.01 A |
| 5 | 30 | 25 | 0.04 |

Voltage V=100 volts

|  |  |  |  |
| --- | --- | --- | --- |
| Distance (cm) | Angle (dA) | D\*2 | I=1/d\*2 |
| 50 | 3 | 2500 | 0.0004 |
| 43 | 3.3 | 2023 | 0.000493 |
| 40 | 4 | 1600 | 0.000623 |
| 33 | 5 | 1225 | 0.000216 |
| 30 | 6.5 | 400 | 0.000111 |
| 25 | 8.5 | 625 | 0.0016 |
| 20 | 13 | 400 | 0.0025 |
| 15 | 22 | 225 | 0.0031 |
| 10 | 63 | 100 | 0.01 |
| 8 | 80 | 64 | 0.010 |
| 3 | 120 | 9 | 0.111 |

For voltage V= 150 volts

|  |  |  |  |
| --- | --- | --- | --- |
| Distance (cm) | Angle (dA) | D\*2 | I=1/d\*2 |
| 50 | 6 | 2500 | 0.0004 |
| 43 | 6.3 | 2023 | 0.000413 |
| 40 | 8 | 1600 | 0.000623 |
| 33 | 9.5 | 1223 | 0.000819 |
| 30 | 12 | 900 | 0.00111 |
| 25 | 17 | 623 | 0.0016 |
| 20 | 26 | 400 | 0.0023 |
| 15 | 46 | 225 | 0.0044 |
| 10 | 130 | 100 | 0.01 |

|  |  |  |  |
| --- | --- | --- | --- |
| 5 | 360 | 25 | 0.04 |

For Voltage V= 250 volts

|  |  |  |  |
| --- | --- | --- | --- |
| Distance (cm) | Angle (dA) | D\*2 | I=1/d\*2 |
| 50 | 16 | 2500 | 0.0004 |
| 45 | 18 | 2025 | 0.000433 |
| 40 | 22 | 1600 | 0.000623 |
| 33 | 27 | 1223 | 0.000819 |
| 30 | 37 | 900 | 0.00111 |
| 25 | 70 | 625 | 0.0016 |
| 20 | 100 | 400 | 0.0023 |
| 15 | 160 | 223 | 0.0044 |
| 10 | 300 | 100 | 0.01 |

# Precautions:

## The connections should be nr]eat and clean.

1. Wire ends should be cleaned with sandpaper.

## Shunt the ammeter to prevent from damage.