



PHOTOELECTRIC EFFECT APPARATUS

5435

Photoelectric effect apparatus

Thanks to this apparatus you are allowed to study the photoelectric effect, retracing the fundamental steps that have underlined the unsuitability of the classic mechanics and have introduced all these new concepts thanks to which the quantum mechanics was born.

The photoelectric effect, or photoemission, is the production of electrons or other free carriers when light is shone onto a material. Changing the LEDs and varying their intensity and the voltage at the phototube, you will be able to check the relation between the energy of the emitted electrons and the wavelength and the intensity of the incident radiation. Thanks to Einstein notion regarding photoelectric effect, you will also be able to estimate the value of the Planck constant.

This instrument is a good starting point to study quantum mechanics. It is basically composed of two parts: a phototube and a control unit (in which is built-in a voltmeter and a nanoammeter).

Three LEDs, with average wavelength known, are supplied.

The light intensity can be varied from 0 to 100%.

Technical data

Power supply: 24 V DC

Voltmeter 4 digits, sensibility < 2 mV

Ammeter 4 digits, sensibility < 5 nA

Button to cut off current

LED light adjustment 0-100%

Anodic tension adjustment

Three LEDs (red, green, blu)



TOPICS

- How to use it
- Historical notes on the nature of light
- Electromagnetic waves
- Intensity of electromagnetic waves
- Photoelectric effect
- Photoelectric cell
- Work function
- Threshold frequency
- Characteristic graphic of a photocell
- Stopping potential
- Kinetic energy of electrons doesn't depend on radiation intensity
- The number of emitted electrons depends on radiation intensity
- Summary
- Einstein quantum theory
- How Einstein quantum theory explains events
- How to value threshold frequency
- How to measure Planck constant

EQUIPMENT SUPPLIED

3 LEDs (green, red and blue)

1 Base with phototube

1 Unit control

1 Power supply

