

PHYS417 Modern Lab

Prelab- The Photoelectric effect

Except where noted, all answers can be found in PASCO write-up.

Background

- 1) What is the photoelectric effect (be sure and compare to classical predictions). Who discovered photoelectric effect (be sure and explain the context that it was discovered)?
- 2) What did Phillip Lenard discover? What is “stopping potential”?
- 3) What is the “work function”?
- 4) How is Planck’s constant found in this experiment?

Experimental apparatus.

- 5) What is a diode? What is a photodiode? What dark current (from a photodetector)?
- 6) Since the current from the photoelectric effect is very small, that current is amplified for this experiment using a PASCO current amplifier. Using the website I have given below answer the following.

<https://www.electronicshub.org/current-amplifiers-and-buffers/>

What is the gain of a current amplifier?

What are the characteristics of an ideal current amplifier.

Using the circuit diagram of an ideal vs practical (real) amplifier comment on the resistance of both the input & output impedance (i.e., resistance). of real amplifier. In other words, comment on the presence of resistors in the practical (real)amplifier.

Principle of experiment

- 7) ‘Google’ question. Using the internet lookup & answer “Why is the stopping potential in the photoelectric effect negative?”
- 8) Explain the difference between Fig 2 (Current vs. intensity) and Fig 3 (Current vs. Frequency) on page 5 of PASCO write-up.