

UNIVERSITY OF WATERLOO

Physics 360 – Experiment 3

IONIZATION POTENTIALS

References: American Journal of Physics 4, 93 (1936)
American Journal of Physics 8, 322 (1940)
Hamwell and Livingwood – Experimental Atomic Physics

Object: To determine the ionization potential of argon

Apparatus: 6.3 volt AC source
0 – 30 volt DC source
Simpson multimeter
Taylor multimeter
884 Thyatron
47 Ω resistor
1000 Ω resistor

Experiment: The 884 is an argon filled triode, and can be connected as a diode for this experiment. Deviations from Child’s law can be used to determine the ionization potential of argon.

The suggested circuit is given below. Obtain several curves of anode current versus voltage for the three 884 tubes and compute the ionization potential for argon. Discuss your basis for selection of the “break-points” of the curves, and your treatment of errors.

