

Lab Four: Electrical Resistance: Part 1 and Part 2

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1 Procedure

During part one of the lab the section D was not executed properly as we used our multimeter as an Ohmmeter rather than the specified directions to test the resistance with different voltages. Throughout part two of the lab due to our lack of practice with testing the resistors we burnt up a resistor with a high Voltage and a small resistance.

2 Abstract

The calculations were found with the use of Kirchhoff's Loop Rule and Junction Rule as well as Resistance in Series and in Parallel. $R = \Delta V / I$ was used in parts 1 and 2 of the lab. $CV = Q$ was used in Part 1 of the Lab.

3 Calculations and Reasoning

In Part One of the lab part A it was found that if you unscrew the bulb in the slightest it goes to zero current; the bulb has two metal parts separated by the voltage stays the same because its in parallel. The current goes through the wires because voltage is not Ohmic. Ohm's Law states that two points are needed for voltage readings on a Voltmeter. Ammeters must be in series if placed in parallel it can be bypassed or the readings may be misconstrued. When Calculating the Resistance for One Change in Voltage Our $R = (17.8 \pm .25)\Omega$. When you unscrew the lightbulb, leaving an Air Gap, the current goes to zero so the resistance is infinite. For Part C the resistance for another ΔV , *Ohm's Law* Our voltmeter read $(1.020 \pm .001)$ V and Ammeter read $(.080 \pm .001)$ A giving the Resistance as $(12.75 \pm .17)\Omega$. For Part D Resistance for a resistor our Ohmmeter read $(9.96 \pm .001) \Omega$

In Part Two of the Lab the I versus ΔV graph is attached for our unknown will show you that our unknown resistor is non-Ohmic. Our findings were that the unknown resistor 3B was a Diode. In proving Kirchhoff's loop rule and junction rule our findings were accurate. With respect to the loop rule the all three currents were equal and opposite meaning the the sum of all voltage at the Loop was Zero. The R_1 was in parallel with the two resistors in series, R_2 and R_3 . Their voltages were the same at 5.05V through R_1 and the sum of the R_2 and R_3 was 5.05 V. The Junction rule was found as well the sum of the voltages equals zero. The currents found after resistor 1 was was $(1.9 \pm .1) * 10^{-3}$ A and after resistor 2 was $(2.3 \pm .1) * 10^{-3}$ A and after the Junction was $(4.1 \pm .1) * 10^{-3}$ A. Thus with respect to the Kichhoff's Junction rule and the propagation of error the currents in match current out.