**Iona Physics -- Lab**

**To measure the resistance of a small light bulb using Capstone.**

 

NOTES:

1. It is very important that the voltmeter is connected in parallel and the ammeter is connected in series.

2. NEVER exceed 5 volts during this experiment.

Procedure:

1. Attach the voltage-current sensor to the USB-LINK and plug the USB-LINK into your computer.
2. Start the PASCO Capstone software.
3. Reply to the first screen by clicking on TWO LARGE DIGITS
4. On the top display click on SELECT MEASUREMENT then choose VOLTAGE
5. On the bottom display click on SELECT MEASURENENT then choose CURRENT
6. Near the bottom there is a window which says 20.0 Hz. Click on the down arrow and change that reading to 2 s. That will take a reading every 2 seconds, making it easy for you to record your readings.
7. Plug in the variable power supply and turn the knob all the way counter-clockwise. (0 volts)
8. Plug the RED VOLTAGE lead of the Voltage/Current sensor into the red (+ DC) jack on the power supply.
9. Plug the BLACK VOLTAGE lead of the Voltage/Current sensor into the black (-DC) jack on the power supply.
10. Plug a jumper wire into the jack of the red lead which is already plugged into the red(+DC) jack on the power supply. The other end of this wire goes to the + Current jack on the Voltage/Current sensor.
11. Plug a jumper wire into the – Current jack on the Voltage/Current sensor.
12. Add an alligator clip to the other end of that jumper wire and clip it to one of the wires coming off of the bulb.
13. Take another jumper wire. Plug one end of it into the black lead which is already plugged into the black (-DC) jack of the power supply.
14. Add an alligator clip to the other end of that wire and clip it to the other wire coming off of the bulb. – At this point your circuit should be complete.
15. Hit RECORD on Capstone, and both readings should be zero.
16. VERY SLOWLY increase the voltage on the power supply. Every two seconds a reading will be displayed.
17. DURING THIS EXPERIMET NEVER EXCEED 5 VOLTS.
18. Record the voltage and the corresponding current for at least 10 different voltages between 1 and 5 volts. For each reading calculate the corresponding resistance
19. Record your data in a table

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| Voltage (V) | Current (A) | Resistance (Ohms) |
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20. Draw a graph with voltage on the X-Axis and Resistance on the Y-Axis.

Conclusion: As the voltage increases, the resistance (increases, decreases, remains constant).