

# Ohmic Heat

## Pre-lab Test 4 (10 Points)

Print Name \_\_\_\_\_

Section \_\_\_\_\_ Date \_\_\_\_\_ TA \_\_\_\_\_

- Current is passed through a resistor immersed in liquid nitrogen (LN<sub>2</sub>). This results in the evaporation of LN<sub>2</sub>. Calculate the latent heat of evaporation L<sub>v</sub> (joules/gram) using the linear regression function on your calculator and the data in the table below.

Volt V volt	Current I amp	ΔM g	Δt s	ΔM/Δt g/s	Power VI joule/s
19.52	0.70	4.00	60.00		
17.53	0.63	4.00	80.00		
15.39	0.55	4.00	103.00		
13.16	0.45	4.00	152.00		
9.62	0.32	4.00	280.00		

L<sub>v</sub> = \_\_\_\_\_ Slope from calculator's linear regression function.

- If we supply 175.12 joules of thermal energy for 13.20 seconds at 18.95 V to a carbon resistor initially at 22.3°C, it may burn. Calculate the work done by the power supply, the current and the resistance of the resistor. (Assume that the temperature of the resistor remains constant during these 13.20 seconds, even though it would burn if we actually did this. This resistor will be immersed in liquid nitrogen during the experiment, so it will not burn up.)

Don't forget to show your formula for each calculation.

W = \_\_\_\_\_

I = \_\_\_\_\_

R = \_\_\_\_\_