DRAFT LAB

To Determine the relationship between the Kilocalorie and the Joule.

A Kilocalorie (also, confusingly known as a Calorie - with capital C) is the amount of heat required to change the temperature of 1 kilogram of water by 1 centigrade degree. This is also the unit which is used to measure the energy content of food.

You will pass an electrical current through a coil of wire. The resistance of the wire will convert the electrical energy (E = Voltage*Current*Time) into heat (Q) which will change the temperature of the water and the inner calorimeter cup.

Heat (Q) = mass*specific heat * change in temp

Specific heat of water = 1 kilocalorie/kilogram C^O

Specific heat of aluminum (calorimeter cup) = .22 kcal/kg C^O

Procedure:

1. Record the mass of the inner calorimeter cup = Mc _____kg.

2. Fill it to about 80% capacity with water. Obtain the mass _____ kg.

3. Subtract to find the mass of the water = Mw_____ kg

4. Record the temperature of the water to the nearest 0.1 degree before you heat it

= Ti _____ ^oC

5. Connect the power supply, voltmeter and ammeter into the circuit including the resistance coil of the calorimeter

6. Start the stopwatch at the same time as you turn on the power.

7. Record the voltage and current as accurately as you can. ATTEMPT TO KEEP THE CURRENT CONSTANT BY SLIGHT ADJUSTMENTS TO THE POWER SUPPLY.

8. When the temperature has risen by about 10 degrees, turn off the power and simultaneously stop the stopwatch.

9. Record the amount of time elapsed. t = _____ sec

10. Stir the water and observe the temperature. When the temperature remains stable, record the final temperature = Tf _____

11. Calculate how much heat was generated = Q _____ kcal

12. Calculate how much electrical energy was used =E _____kjoules

13. Calculate the conversion factor = E/Q