4. Be sure that the resistance thermometer probe is dry and that it is far away from the electric stove. Prop the probe with the tip in the air and not touching the table or other objects. Plug its black wire into the jack of the digital multimeter marked "COM". Plug the red lead from the probe into the jack marked "kΩ". Be sure Press the button marked "kΩ" and the button marked "200 kΩ". Find the room temperature to the nearest .1 °C with your own resistance thermometer. Read the resistance on the digital multimeter and use the temperature conversion chart.

Room temperature = 23° °C

5. Weigh the empty calorimeter cup. Then fill the cup about three-quarters full of water at a temperature a few degrees below room temperature. (If the tap water or other water provided in the laboratory is not cool enough, mix some of it with water from the drinking fountain.) Weigh the cup again and subtract the mass of the empty container to find the mass of the water m_w.

Mass of cup and water = 282.7 g

Mass of empty cup = 56.3 g

Mass of water: m_w = 226.4 g

6. Remove the split rubber stopper from the calorimeter and install the resistance-thermometer probe through the hole in the stopper. Reinstall the stopper and thermometer probe in the calorimeter.

7. After the metal sample (i.e., the aluminum cylinder) has been in the boiling water for at least 5 minutes, measure and record the temperature of the boiling water with the -20 to + 110 °C glass thermometer. Record this temperature as the initial temperature of the metal sample (t_{1s}). But do not use the same thermometer probe as is being used for measurements in the calorimeter.

Temperature of boiling water =
Initial temperature of metal sample: t_{1s} = 100 °C

8. The initial temperature of the water in the calorimeter cup should be about 2.0 C° below room temperature. If the temperature is too low, raise the temperature by grasping the inner cup with your hand. When the temperature is within a few tenths of a degree of the correct starting temperature, allow the water temperature to rise slowly and naturally (without warming the cup with your hand). Stir the water frequently to keep the temperature uniform; but do not stir so vigorously as to slosh water out of the inner cup. When the water temperature is approximately correct, measure it with the resistance thermometer and chart. Record this temperature to the nearest .01 or .02 °C as t_{1w}.

Initial water temperature: t_{1w} = 19.48 °C

9. Use the wire with the loop on the end and transfer the metal sample from the boiling water to the calorimeter water. Shake off drops of hot water clinging to the metal sample before placing it in the calorimeter; but keep the time for the transfer to a minimum. The calorimeter may be moved near the boiling water temporarily during the transfer of the metal sample; but be sure that the calorimeter is remote from the boiling water before and after the transfer.

10. Stir the water in the calorimeter continuously, but not so vigorously as to splash water out of the inner cup. Temperature measurements taken during the first two minutes may not be very meaningful. Continue stirring the calorimeter water after the first two minutes while observing the thermometer to determine the highest temperature reached (corresponding to the lowest resistance). Record this temperature as t_{2w} to the nearest .01 or .02 °C.

Final water temperature: t_{2w} = 22.07 °C