11. The specific heat of water is given in the theory section of this laboratory instruction. The laboratory instructor can give you the water equivalent of the calorimeter. Record these values below.

Specific heat of water: c_w = 1 cal/(g·C°)

Water equivalent of calorimeter: m_e = 16.3 g

12. Calculate the heat added to the calorimeter and calorimeter water:

$$Q = (m_w + m_e)\, c_w\, (t_{2w} - t_{1w})$$

$$= (226.4 + 16.3) \times 1 \times (22.7 - 19.6) \quad \text{(Substitute)}$$

$$= 752.37 \text{ cal} \quad \text{(Final answer)}$$

13. Calculate your measured value of the specific heat of the metal sample.

$$c_{smeas} = \frac{Q}{m_s(t_{1s} - t_{2w})}$$

$$= \frac{752.37}{37.2(100 - 22.07)} \quad \text{(Substitute)}$$

$$= 1519.572 \text{ cal/(g·C°)} \approx 1519.57. \quad \text{(Final answer)}$$

14. Look up the accepted value of the specific heat of the metal sample in a textbook or handbook of chemistry or physics. Calculate the percent error in your measured value of the specific heat.

$c_{saccept}$ = .215 cal/(g·C°)

$$\% \text{ Error} = \frac{c_{smeas} - c_{saccept}}{c_{saccept}} \times 100$$

$$= \frac{1519.57 - .215}{0.215} \times 100 \quad \text{(Substitute)}$$

% Error = 7006676.7 % (Final answer)

15. Copy your experimental and calculated results onto the Data Table.

16. If time permits, repeat steps 1 through 15 for a second metal sample (not aluminum). Be sure to record the type of metal sample (aluminum, etc.) on the Data Table for both samples. Note that it will be necessary to replace the water in the calorimeter cup and reweigh it. The initial water temperature should be about 1 C° below room temperature for the second sample (not aluminum). The room temperature should be measured again.