Calorimetry Calculations

Calculations

Calculate the specific heat of the unknown metal. The specific heat of water, c_{water} is 4186 J/kg˚C. Remember that the final temperature of the water–the equilibrium temperature–is also the final temperature of the metal object.

$$m_{object} c_{object} \Delta T_{object} = m_{water} c_{water} \Delta T_{water}$$

$$m_{object} c_{object} \left(T_{final} - T_{initial} \right)_{object} = m_{water} c_{water} \left(T_{initial} - T_{final} \right)_{water}$$

Solve for the specific heat of the object, c_{object}.

Item	Value
Specific Heat of Metal	J/kg˚C

Compare the value you obtained with your data (measured) to the value in the list (accepted). For example, what is the percent difference between your measured value and the accepted value? $\%diff = \left| \frac{accepted - measured}{accepted} \right| \times 100$

Tables

Mass of metal	
T of boiling water ($T_{i(m)}$) (initial T of metal)	
Mass of Calorimeter	
Mass of calorimeter & water	
Initial T ($T_{i(w)}$) of calorimeter water	
Final temperature of metal and water (calorimeter)	

Mass of water in calorimeter	
ΔT of water ($T_f - T_{i(w)}$)	
ΔT of metal ($T_f - T_{i(m)}$)	
Heat (J) gained by the water $Q_w = m \times c_w \times \Delta T_w$	
Specific Heat of metal (c_m) (calculate from equation) $Q_m = m_m \times c_m \times \Delta T_{metal}$ **Note:** Q lost by water = – Q gained by metal	