

Purpose: to calculate the final temperature of a mixture.

Procedure: (1) Weigh cup (2) fill cup 1/3 full of cold water (from drinking fountain) and reweigh (3) reassemble calorimeter and take initial temperature (4) take temp. of hot water, then gently pour hot water into calorimeter cup until cup is 2/3rds full (5) stir and get final temperature (6) reweigh the cup with the waters in it (7) Clean up.

Data:

Calculations:

Specific heat of cup	903 J/kg°C	Mass of cold water	kg
mass of cup	kg		
Mass of cup + cold water	kg	Mass of hot water	kg
T _i of cup + cold water	°C		
T _i of hot water	°C	ΔT of cup + cold water	°C
T _f of cup + mixture	°C		
Mass of cup + mixture	kg	ΔT of hot water	°C

Questions:

1. How much heat was lost by the hot water? $Q = m c \Delta T$
2. How much heat was gained by the cup? $Q = m c \Delta T$
3. How much heat was gained by the cold water? $Q = m c \Delta T$
4. How does the heat lost compare to the total heat gained? Why is there a difference?
5. Why do the cup and the cold water always have the same temperature?
6. What is your theoretical T_f? % error?

$$T_f = \frac{m c T_i + m c T_i + m c T_i}{m c + m c + m c} = \text{_____}^{\circ}\text{C} \quad \% \text{ error} = \frac{(\text{Theoretical} - \text{Actual}) \times 100}{\text{Theoretical}} = \text{_____}$$