

4) Thermometer contains  $1 \times 10^{-4}$  kg mercury & is cooled from  $15.0^\circ\text{C}$  to  $8.50^\circ\text{C}$ . How much energy was lost by the mercury?

$$\Delta T = 6.5^\circ\text{C} = 6.5\text{K} \quad C_{\text{mercury}} = 0.033 \text{ kcal/kg}\cdot\text{K}$$

$$mc \Delta T = \text{heat lost}$$

$$1 \times 10^{-4} \text{ kg} \times 0.033 \frac{\text{kcal}}{\text{kg}\cdot\text{K}} \times 6.5\text{K} = 2.145 \times 10^{-5} \text{ kcal}$$

$$1 \text{ kcal} = 4.186 \times 10^3 \text{ J}$$

$$\begin{aligned} \text{Energy lost} &= 2.145 \times 10^{-5} \text{ kcal} \times 4.186 \times 10^3 \text{ J} \\ &= 0.09 \text{ J} \quad \text{(B)} \end{aligned}$$