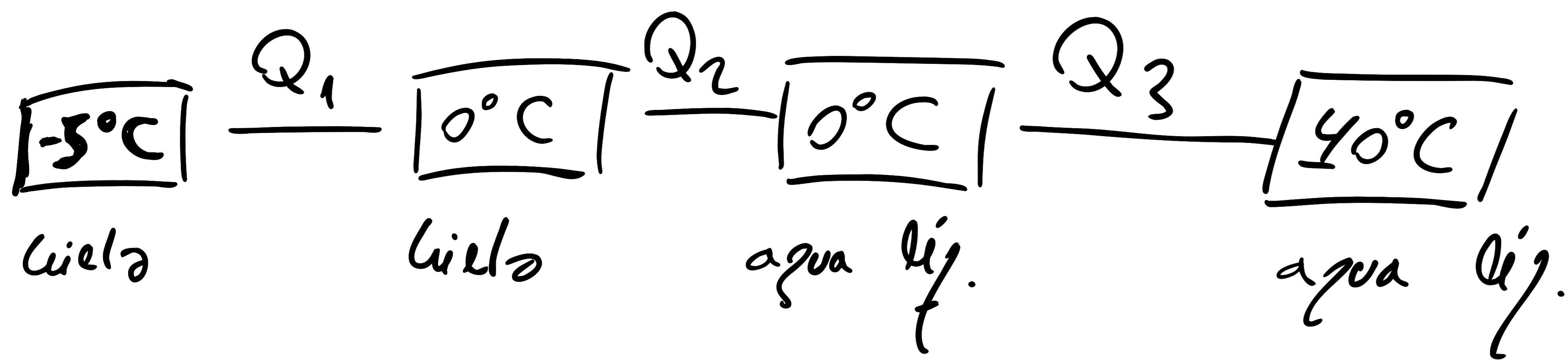


3 - CALOR



$$Q_{\text{total}} = Q_1 + Q_2 + Q_3$$

$$Q_1 = Q_{\text{abs.}} = m \cdot c_e \cdot \Delta T = (0.5 \text{ kg}) \left(2090 \frac{\text{J}}{\text{kg} \cdot ^{\circ}\text{C}} \right) (0^{\circ}\text{C} - (-5^{\circ}\text{C}))$$

$$Q_1 = 5225 \text{ J}$$

$$Q_2 = m \cdot L_{\text{fusión, agua}} = (0.5 \text{ kg}) \left(334000 \frac{\text{J}}{\text{kg}} \right) = 167000 \text{ J}$$

$$Q_2 = 167000 \text{ J}$$

$$Q_3 = m \cdot c_e \cdot \Delta T = (0.5 \text{ kg}) \left(4180 \frac{\text{J}}{\text{kg} \cdot ^{\circ}\text{C}} \right) ((40 - 0)^{\circ}\text{C})$$

$$Q_3 = 83600 \text{ J}$$

$$Q_{\text{total}} = (5225 + 167000 + 83600) \text{ J} = 255825 \text{ J}$$

$$255825 \text{ J} \cdot \frac{1 \text{ cal}}{4.18 \text{ J}} = \boxed{61202 \text{ cal} = Q_{\text{requerido}}}$$