

2. $C_{\text{water}} = 4.184 \text{ J/g} \cdot ^\circ\text{C}$ $M = 100.0 \text{ g}$ | $q_{\text{water}} = \text{--- J}$
 $T_{\text{final}} = 69.2^\circ\text{C}$ $T_{\text{ini}} = 100.0^\circ\text{C}$ | $q_{\text{metal}} = \text{--- J}$

Water bath

① $\Delta T = T_{\text{final}} - T_{\text{ini}}$
 $= 69.2^\circ\text{C} - 100.0^\circ\text{C}$
 $\Delta T = -30.8^\circ\text{C}$
 (Water lose q , exo)

② $q_{\text{water}} = C_w \cdot M_w \cdot \Delta T_w$
 $q_w = 4.184 \text{ J/g} \cdot ^\circ\text{C} \cdot 100.0 \text{ g} \cdot (-30.8^\circ\text{C})$
 $q_w = -12886.72 \text{ J}$

③ $q_{\text{metal}} = -q_w$ $q_{\text{metal}} = +12886.72 \text{ J}$
 (endo, gaining)

$q_{\text{CaCl}_2 (\text{metal})} = -2200 \text{ J}$ $q_{\text{water}} = \text{--- J}$ $C_{\text{water}} = 4.184 \text{ J/g} \cdot ^\circ\text{C}$
 $T_{\text{ini}} = 25.0^\circ\text{C}$ $T_{\text{final}} = 55.0^\circ\text{C}$ $M_{\text{water}} = \text{--- g}$

① $q_w = -q_{\text{CaCl}_2}$
 $q_{\text{water}} = +2200 \text{ J}$

② $\Delta T = T_{\text{final}} - T_{\text{ini}}$
 $\Delta T = 55.0^\circ\text{C} - 25.0^\circ\text{C}$
 $= 30.0^\circ\text{C}$

③ $M_{\text{water}} = \frac{q}{C \cdot \Delta T}$
 $M = \frac{2200 \text{ J}}{4.184 \text{ J/g} \cdot ^\circ\text{C} \cdot 30.0^\circ\text{C}}$
 $M = 17.53 \text{ g water}$