

A block of aluminum at 95.0°C is placed into 500. g of water at 21.5°C . The final temperature of the water and aluminum is 28.0°C . Determine the mass of the aluminum.

Al
block
 $T_i = 95.0^{\circ}\text{C}$
 $T_f = 28.0^{\circ}\text{C}$
 $m = ?$

H₂O
 $m = 500. \text{g}$
 $T_i = 21.5^{\circ}\text{C}$
 $T_f = 28.0^{\circ}\text{C}$

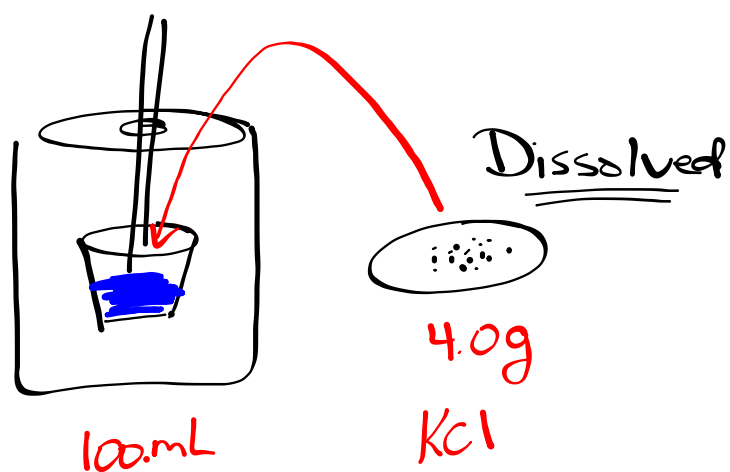
$$q_{\text{Al}} = -q_{\text{H}_2\text{O}}$$

$$m_{\text{Al}} C \Delta T = -m_{\text{H}_2\text{O}} C \Delta T$$

$$m_{\text{Al}} \left(0.900 \frac{\text{J}}{\text{g} \cdot ^{\circ}\text{C}} \right) (28.0^{\circ}\text{C} - 95.0^{\circ}\text{C}) = - (500. \text{g}) \left(4.19 \frac{\text{J}}{\text{g} \cdot ^{\circ}\text{C}} \right) (28.0^{\circ}\text{C} - 21.5^{\circ}\text{C})$$

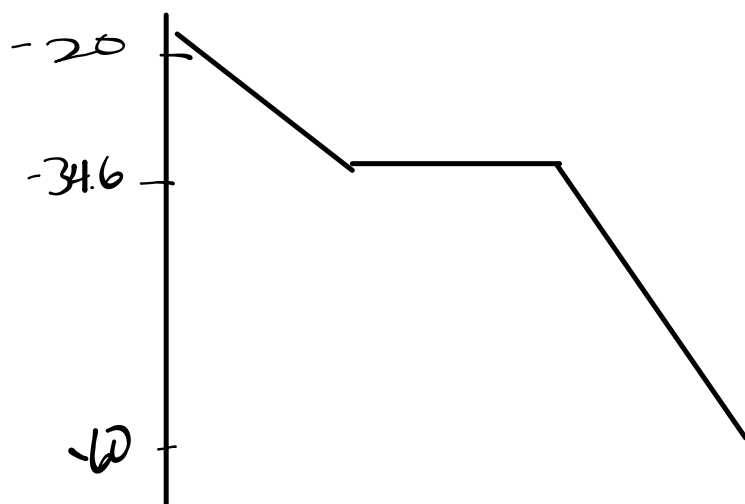
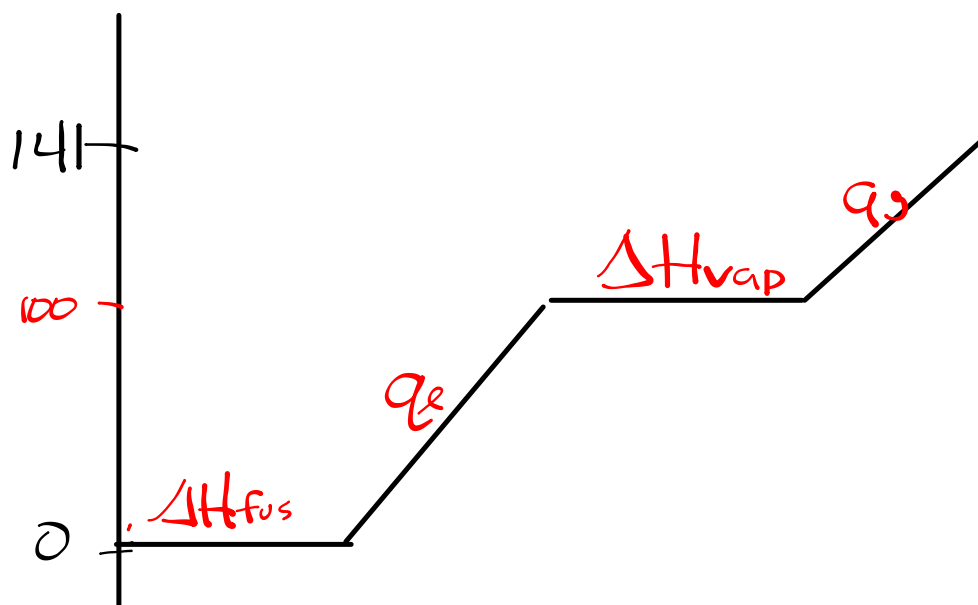
$$m_{\text{Al}} = \frac{- (500. \text{g}) (4.19 \frac{\text{J}}{\text{g} \cdot ^{\circ}\text{C}}) (6.5^{\circ}\text{C})}{(0.900 \frac{\text{J}}{\text{g} \cdot ^{\circ}\text{C}}) (-67.0^{\circ}\text{C})}$$

$$m_{\text{Al}} = 226 \text{g}$$



$$\Delta H_s = -q$$

$$nH_s = -vC\Delta T$$



Cl_2
 \downarrow
 2×35.45
70.90

Homework

Worksheet