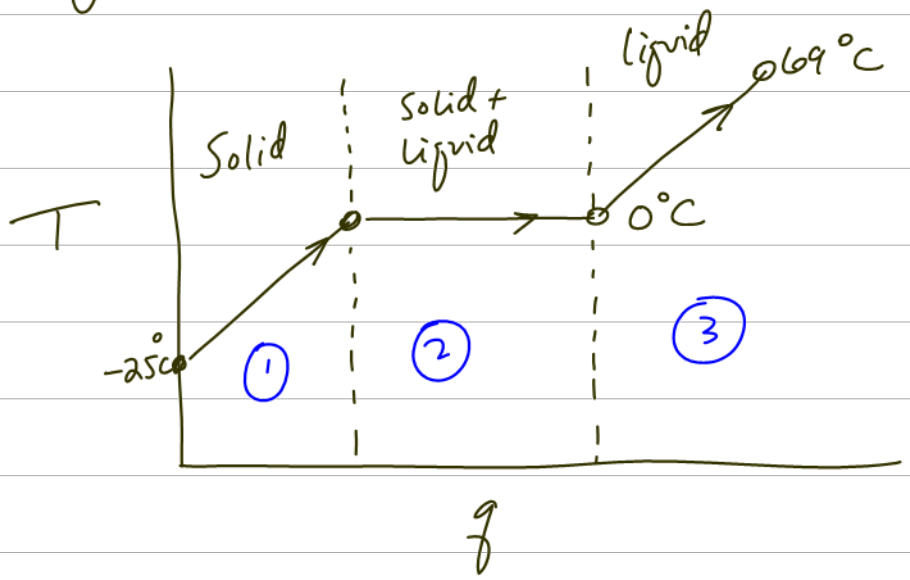
① 117 g H_2O @ −25°C heated to 69°C



① $q = m \cdot c \cdot \Delta T$

$q_1 = (117\ \cancel{g})\left(2.01\ \frac{J}{\cancel{g} \cdot \cancel{°C}}\right)(0-(-25))\ \cancel{°C}\left(\frac{K}{1000}\right) = 5.87\bar{9}\ KJ$

② $q_2 = ?\ KJ = \dfrac{117\ g \mid 334\ J \mid K}{g \mid 1000} = 39.0\bar{7}\ KJ$

③ $q_3 = m \cdot c \cdot \Delta T$

$= (117\ \cancel{g})\left(4.184\ \frac{J}{\cancel{g} \cdot \cancel{°C}}\right)(69-0)\ \cancel{°C}\left(\frac{K}{1000}\right) = 33.\bar{7}\ KJ$

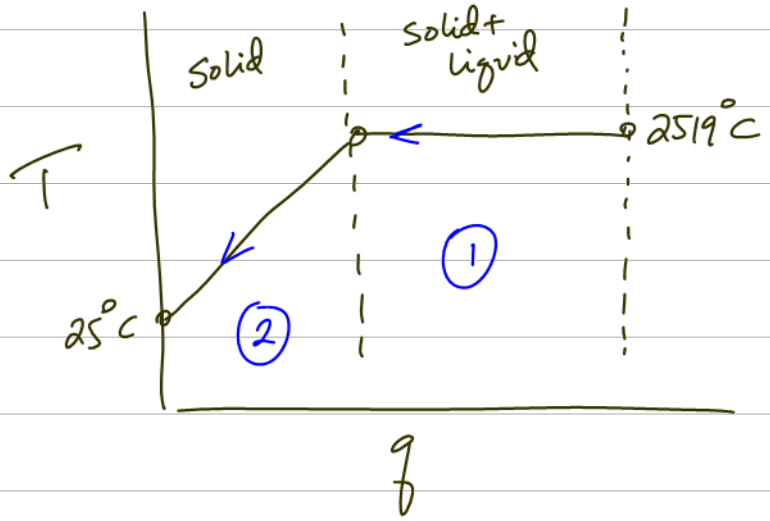
$q_{tot} = q_1 + q_2 + q_3 = 5.87\bar{9}\ KJ + 39.0\bar{7}\ KJ + 33.\bar{7}\ KJ$

$= 78.\bar{6} \longrightarrow \boxed{+79\ KJ}$

② 755 g Al @ boiling pt. (@ 2519°C) cooled to 25°C

$H_{fusion} = 398\ KJ/Kg$, note: $H_{freezing} = -398\ KJ/Kg$

Change sign!



$$q_1 \; ; \quad ? \text{ KJ} = \frac{755 \cancel{\text{ g Al}} \;\Big|\; -398 \text{ KJ} \;\Big|\; \cancel{\text{K}}}{\cancel{\text{Kg}} \;\Big|\; 1000} = -300.\bar{4} \text{ KJ}$$

$$q_2 = m \cdot c \cdot \Delta T$$

$$= \left(755 \cancel{\text{ g}}\right)\left(0.900 \frac{\text{J}}{\cancel{\text{g}} \cdot \cancel{^\circ\text{C}}}\right)\left(25 - 2519\right)\cancel{^\circ\text{C}}\left(\frac{\text{K}}{1000}\right) =$$

$$= -169\bar{4} \text{ KJ}$$

$$q_{tot} = q_1 + q_2 = -300.\bar{4} \text{ KJ} + \left(-169\bar{4} \text{ KJ}\right)$$

$$= -199\bar{5} \text{ KJ} \rightarrow \boxed{-2.00 \times 10^3 \text{ KJ}}$$