

## ENTHALPY CALCULATION EXAMPLE

Calculate the enthalpy change for the melting of 13 g of ice.

SOLUTION



$$m_{\text{H}_2\text{O}} = 13 \text{ g}$$

The molar enthalpy for the melting of water can be found in reference tables.

The positive value means heat is absorbed (endothermic).

### Step 1

Calculate the amount (in moles) of water.

$$\begin{aligned} n_{\text{H}_2\text{O}} &= \frac{m_{\text{H}_2\text{O}}}{M_{\text{H}_2\text{O}}} \\ &= \frac{13 \text{ g}}{18.02 \text{ g mol}^{-1}} \\ &= 0.72142... \text{ mol} \end{aligned}$$

n = amount in moles  
m = mass  
M = molar mass

### Step 2

Calculate the enthalpy change.

$$\begin{aligned} \Delta H &= n_{\text{H}_2\text{O}} \Delta H_{\text{melt}} \\ &= (0.72142... \text{ mol})(+6.03 \text{ kJ mol}^{-1}) \\ &= +4.35016... \text{ kJ} \end{aligned}$$

Therefore, the enthalpy change for the melting of 13 g of ice is +4.4 kJ.