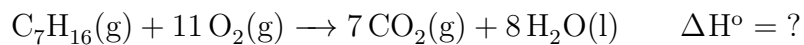


WORKSHEET 2 - QUESTION 5



$$Q = ?$$

$$m = 50.0 \text{ L} \Rightarrow 50\,000 \text{ mL} \Rightarrow 50\,000 \text{ g}$$

$$c = 4.184 \frac{\text{J}}{\text{g}^\circ\text{C}}$$

$$\Delta T = (31.187 - 22.000)^\circ\text{C} = 9.187^\circ\text{C}$$

$$Q = mc\Delta T$$

$$Q = 50\,000 \text{ g} \times 4.184 \frac{\text{J}}{\text{g}^\circ\text{C}} \times 9.187^\circ\text{C}$$

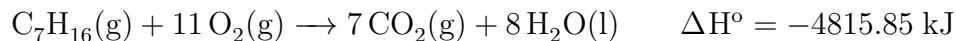
$$Q = 1921920.4 \text{ J}$$

$$Q = 1921.92 \text{ kJ}$$

$$\frac{1921.92 \text{ kJ}}{40.0 \text{ g C}_7\text{H}_{16}} \times \frac{100.23 \text{ g C}_7\text{H}_{16}}{1 \text{ mol C}_7\text{H}_{16}} = \frac{4815.85 \text{ kJ}}{1 \text{ mol C}_7\text{H}_{16}}$$

$$\Delta H = -Q$$

$$\Delta H = -4815.85 \text{ kJ}/1 \text{ mol C}_7\text{H}_{16}$$



$$\begin{aligned} \Delta H^\circ &= [7\Delta H^\circ_{\text{CO}_2(\text{g})} + 8\Delta H^\circ_{\text{H}_2\text{O}(\text{l})}] - [\Delta H^\circ_{\text{C}_7\text{H}_{16}(\text{g})} + 11 \Delta H^\circ_{\text{O}_2(\text{g})}] \\ -4815.85 \text{ kJ} &= [7(-393.5 \text{ kJ}) + 8(-285.8 \text{ kJ})] - [\Delta H^\circ_{\text{C}_7\text{H}_{16}} + 11(0)] \end{aligned}$$

$$\Delta H^\circ_{\text{C}_7\text{H}_{16}(\text{g})} = -5040.9 \text{ kJ} + 4815.85 \text{ kJ}$$

$$\Delta H^\circ_{\text{C}_7\text{H}_{16}(\text{g})} = -225.05 \text{ kJ}$$
