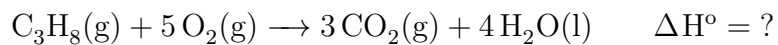


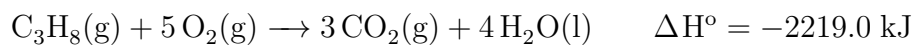
COMBINATION PROBLEM 6



$$\Delta H^\circ = [3\Delta H_{\text{CO}_2(\text{g})}^\circ + 4\Delta H_{\text{H}_2\text{O}(\text{l})}^\circ] - [\Delta H_{\text{C}_3\text{H}_8(\text{g})}^\circ + 5\Delta H_{\text{O}_2(\text{g})}^\circ]$$

$$\Delta H^\circ = [3(-393.5 \text{ kJ}) + 4(-285.8 \text{ kJ})] - [-104.7 \text{ kJ} + 5(0)]$$

$$\Delta H^\circ = -2219.0 \text{ kJ}$$



$$Q = -\Delta H$$

$$Q = 2219.0 \text{ kJ/mol C}_3\text{H}_8$$

$$Q = mc\Delta T$$

$$Q = 160\,000 \text{ g} \times 4.184 \frac{\text{J}}{\text{g}^\circ\text{C}} \times (52.00 - 15.00)^\circ\text{C}$$

$$Q = 24769280 \text{ J}$$

$$Q = 24769.28 \text{ kJ}$$

$$24769.28 \text{ kJ} \times \frac{1 \text{ mol C}_3\text{H}_8}{2219.0 \text{ kJ}} \times \frac{44.11 \text{ g C}_3\text{H}_8}{1 \text{ mol C}_3\text{H}_8} = 492.37 \text{ g C}_3\text{H}_8$$