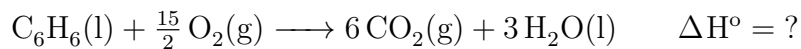


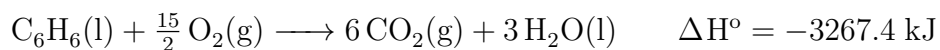
COMBINATION PROBLEM 5



$$\Delta H^\circ = [6\Delta H_{\text{CO}_2(\text{g})}^\circ + 3\Delta H_{\text{H}_2\text{O}(\text{l})}^\circ] - [\Delta H_{\text{C}_6\text{H}_6(\text{g})}^\circ + \frac{15}{2}\Delta H_{\text{O}_2(\text{g})}^\circ]$$

$$\Delta H^\circ = [6(-393.5 \text{ kJ}) + 3(-285.8 \text{ kJ})] - [+49.0 \text{ kJ} + \frac{15}{2}(0)]$$

$$\Delta H^\circ = -3267.4 \text{ kJ}$$



$$Q = -\Delta H$$

$$Q = 3267.4 \text{ kJ/mol C}_6\text{H}_6$$

$$100 \text{ kJ} \times \frac{1 \text{ mol C}_6\text{H}_6}{3267.4 \text{ kJ}} \times \frac{78.12 \text{ g C}_6\text{H}_6}{1 \text{ mol C}_6\text{H}_6} = 2.391 \text{ g C}_6\text{H}_6$$