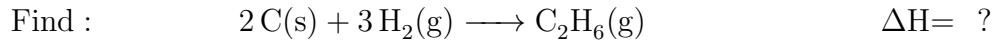


HESS' LAW 3



Given :

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| (1) | $\text{C}_2\text{H}_6\text{(g)} + \frac{1}{2} \text{Cl}_2 \longrightarrow \text{C}_2\text{H}_5\text{Cl(g)} + \frac{1}{2} \text{H}_2\text{(g)}$ | $\Delta H = + \quad 8.6 \text{ kJ}$ |
| (2) | $\text{C}_2\text{H}_5\text{OH(l)} + 3 \text{O}_2\text{(g)} \longrightarrow 2 \text{CO}_2\text{(g)} + 3 \text{H}_2\text{O(l)}$ | $\Delta H = - \quad 1409.2 \text{ kJ}$ |
| (3) | $\text{C}_2\text{H}_5\text{Cl(g)} + \text{H}_2\text{O(l)} \longrightarrow \text{C}_2\text{H}_5\text{OH(l)} + \text{HCl(g)}$ | $\Delta H = + \quad 33.5 \text{ kJ}$ |
| (4) | $\text{C(s)} + \text{O}_2\text{(g)} \longrightarrow \text{CO}_2\text{(g)}$ | $\Delta H = - \quad 393.5 \text{ kJ}$ |
| (5) | $\text{H}_2\text{(g)} + \frac{1}{2} \text{O}_2\text{(g)} \longrightarrow \text{H}_2\text{O(l)}$ | $\Delta H = - \quad 285.8 \text{ kJ}$ |
| (6) | $\frac{1}{2} \text{H}_2\text{(g)} + \frac{1}{2} \text{Cl}_2\text{(g)} \longrightarrow \text{HCl(g)}$ | $\Delta H = - \quad 92.3 \text{ kJ}$ |
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| rev (1) | $\text{C}_2\text{H}_5\text{Cl(g)} + \frac{1}{2} \text{H}_2\text{(g)} \longrightarrow \text{C}_2\text{H}_6\text{(g)} + \frac{1}{2} \text{Cl}_2$ | $\Delta H = - \quad 8.6 \text{ kJ}$ |
| rev (3) | $\text{C}_2\text{H}_5\text{OH(l)} + \text{HCl(g)} \longrightarrow \text{C}_2\text{H}_5\text{Cl(g)} + \text{H}_2\text{O(l)}$ | $\Delta H = - \quad 33.5 \text{ kJ}$ |
| rev (2) | $2 \text{CO}_2\text{(g)} + 3 \text{H}_2\text{O(l)} \longrightarrow \text{C}_2\text{H}_5\text{OH(l)} + 3 \text{O}_2\text{(g)}$ | $\Delta H = + \quad 1409.2 \text{ kJ}$ |
| (6) | $\frac{1}{2} \text{H}_2\text{(g)} + \frac{1}{2} \text{Cl}_2\text{(g)} \longrightarrow \text{HCl(g)}$ | $\Delta H = - \quad 92.3 \text{ kJ}$ |
| 2 x (4) | $2 \text{C(s)} + 2 \text{O}_2\text{(g)} \longrightarrow 2 \text{CO}_2\text{(g)}$ | $\Delta H = - \quad 787.0 \text{ kJ}$ |
| 2 x (5) | $2 \text{H}_2\text{(g)} + \text{O}_2\text{(g)} \longrightarrow 2 \text{H}_2\text{O(l)}$ | $\Delta H = - \quad 571.6 \text{ kJ}$ |
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