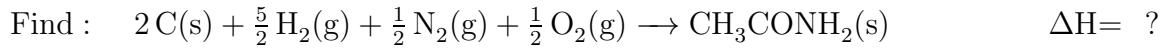


## HESS' LAW 5

---



Given :

|     |  |                                 |
|-----|--|---------------------------------|
| (1) | $\text{C}_2\text{H}_5\text{OH(l)} + \frac{1}{2} \text{O}_2\text{(g)} \rightarrow \text{CH}_3\text{COOH(l)} + \text{H}_2\text{(g)}$ | $\Delta H = - 197.6 \text{ kJ}$ |
| (2) | $\text{C}_2\text{H}_4\text{(l)} + \text{H}_2\text{(g)} \rightarrow \text{C}_2\text{H}_6\text{(g)}$                                 | $\Delta H = - 136.3 \text{ kJ}$ |
| (3) | $\text{C}_2\text{H}_4\text{(g)} + \text{H}_2\text{O(l)} \rightarrow \text{C}_2\text{H}_5\text{OH(l)}$                              | $\Delta H = - 287.7 \text{ kJ}$ |
| (4) | $\text{CH}_3\text{COOH(l)} + \text{NH}_3\text{(g)} \rightarrow \text{CH}_3\text{CONH}_2\text{(s)} + \text{H}_2\text{O(l)}$         | $\Delta H = + 139.5 \text{ kJ}$ |
| (5) | $\frac{1}{2} \text{N}_2\text{(g)} + \frac{3}{2} \text{H}_2\text{(g)} \rightarrow \text{NH}_3\text{(g)}$                            | $\Delta H = - 45.9 \text{ kJ}$  |
| (6) | $2 \text{C(s)} + 3 \text{H}_2\text{(g)} \rightarrow \text{C}_2\text{H}_6\text{(g)}$  | $\Delta H = - 83.8 \text{ kJ}$  |
| (7) | $\text{H}_2\text{(g)} + \frac{1}{2} \text{O}_2\text{(g)} \rightarrow \text{H}_2\text{O(l)}$  | $\Delta H = - 285.8 \text{ kJ}$ |

---

|         |  |                                 |
|---------|--|---------------------------------|
| (4)     | $\text{CH}_3\text{COOH(l)} + \text{NH}_3\text{(g)} \rightarrow \text{CHCONH}_2\text{(s)} + \text{H}_2\text{O(l)}$                  | $\Delta H = + 139.5 \text{ kJ}$ |
| (1)     | $\text{C}_2\text{H}_5\text{OH(l)} + \frac{1}{2} \text{O}_2\text{(g)} \rightarrow \text{CH}_3\text{COOH(l)} + \text{H}_2\text{(g)}$ | $\Delta H = - 197.6 \text{ kJ}$ |
| (3)     | $\text{C}_2\text{H}_4\text{(g)} + \text{H}_2\text{O(l)} \rightarrow \text{C}_2\text{H}_5\text{OH(l)}$                              | $\Delta H = - 287.7 \text{ kJ}$ |
| rev (2) | $\text{C}_2\text{H}_6\text{(g)} \rightarrow \text{C}_2\text{H}_4\text{(g)} + \text{H}_2\text{(g)}$                                 | $\Delta H = + 136.3 \text{ kJ}$ |
| (6)     | $2 \text{C(s)} + 3 \text{H}_2\text{(g)} \rightarrow \text{C}_2\text{H}_6\text{(g)}$  | $\Delta H = - 83.8 \text{ kJ}$  |
| (5)     | $\frac{1}{2} \text{N}_2\text{(g)} + \frac{3}{2} \text{H}_2\text{(g)} \rightarrow \text{NH}_3\text{(g)}$                            | $\Delta H = - 45.9 \text{ kJ}$  |

---

