

$$\Delta H_{298}^{\circ} = \sum \Delta H_{f,298}^{\circ} \text{ produit} - \sum \Delta H_{f,298}^{\circ} \text{ réactif}$$

≠ voir p51

3.9 Calculez le ΔH_{298}° des réactions suivantes :

1. $\text{I}_{2(s)} \rightarrow 2\text{I}_{(g)}$ $\Delta H_{298}^{\circ} = 2 \Delta H_{f,298}^{\circ} \text{I} - \Delta H_{f,298}^{\circ} \text{I}_2$
 $= 2(106,8 \text{ kJ}) - 0 = 213,6 \text{ kJ}$
2. $\text{F}_{2(g)} \rightarrow 2\text{F}_{(g)}$ $\Delta H_{298}^{\circ} = 2(79,4 \text{ kJ}) - 0 = 158,8 \text{ kJ}$
3. $\text{Mg}_{(s)} \rightarrow \text{Mg}_{(g)}$ $147,1 - 0 = 147,1 \text{ kJ}$
4. $2\text{H}_{(g)} \rightarrow \text{H}_{2(g)}$ $0 - 2(218,0 \text{ kJ}) = -436 \text{ kJ}$
5. $\text{N}_{2(g)} \rightarrow 2\text{N}_{(g)}$ $2(472,7 \text{ kJ}) - 0 = 945,4 \text{ kJ}$
6. $2\text{Br}_{(g)} \rightarrow \text{Br}_{2(l)}$ $0 - 2(119,9 \text{ kJ}) = -239,8 \text{ kJ}$
7. $2\text{O}_{(g)} \rightarrow \text{O}_{2(g)}$ $0 - 2(249,2 \text{ kJ}) = -498,4 \text{ kJ}$
8. $\text{C}_{(g)} \rightarrow \text{C}_{(s)}$ $0 - (716,7 \text{ kJ}) = -716,7 \text{ kJ}$
9. $\text{Al}_{(g)} \rightarrow \text{Al}_{(s)}$ $0 - 329,7 \text{ kJ} = -329,7 \text{ kJ}$
10. $\text{Ca}_{(s)} \rightarrow \text{Ca}_{(g)}$ $177,8 - 0 = 177,8 \text{ kJ}$
11. $\text{Ca}_{(s)} + \text{Cl}_{2(g)} \rightarrow \text{CaCl}_{2(s)}$ $-796,1 - 0 - 0 = -796,1 \text{ kJ}$
12. $\text{N}_{2(g)} + 3\text{H}_{2(g)} \rightarrow 2\text{NH}_{3(g)}$ $2(-46,2) - 3(0) - 0 = -92,4 \text{ kJ}$
13. $2\text{H}_2\text{O}_{(l)} \rightarrow 2\text{H}_{2(g)} + \text{O}_{2(g)}$ $0 + 2(0) - 2(286,0) = -572 \text{ kJ}$
14. $2\text{H}_{2(g)} + 2\text{C}_{(s)} + \text{O}_{2(g)} \rightarrow \text{CH}_3\text{COOH}_{(l)}$
 $-487,2 - 2(0) - 2(0) - 0 = -487,2 \text{ kJ}$
15. $\text{CH}_3\text{OH}_{(l)} \rightarrow \text{C}_{(s)} + \frac{1}{2}\text{O}_{2(g)} + 2\text{H}_{2(g)}$
 $0 + \frac{1}{2}(0) + 2(0) - (-238,7) = +238,7 \text{ kJ}$
16. $\text{CaCO}_{3(s)} \rightarrow \text{Ca}_{(s)} + \text{C}_{(s)} + \frac{3}{2}\text{O}_{2(g)}$
 $0 + 0 + 3/2(0) - (-1207,4) = +1207,4 \text{ kJ}$
17. $\text{Cl}_{2(g)} + \frac{1}{2}\text{O}_{2(g)} + \text{C}_{(s)} \rightarrow \text{COCl}_{2(g)}$
 $-223 - 0 - \frac{1}{2}(0) - 0 = -223 \text{ kJ}$