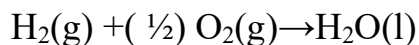
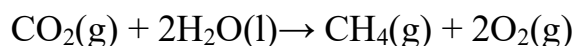


$$\Delta_r H_o = - 393.5 \text{ kJ mol}^{-1}$$



$$\Delta_r H_o = - 285.8 \text{ kJ mol}^{-1}$$



$$\Delta_r H_o = + 890.3 \text{ kJ mol}^{-1}$$

Based on the above thermochemical equations, the value of $\Delta_r H_o$ at 298 K for the reaction $\text{C}(\text{graphite}) + 2\text{H}_2(\text{g}) \rightarrow \text{CH}_4(\text{g})$ will be:

A) + 144 kJ/mol

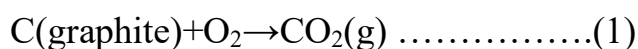
B) -74.8 kJ/mol

C) -144 kJ/mol

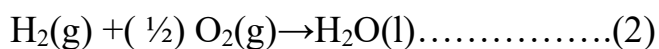
D) +74.8 kJ/mol

Ans: B) -74.8 kJ/mol

Explanation:



$$\Delta_r H_o = - 393.5 \text{ kJ mol}^{-1}$$



$$\Delta_r H_o = - 285.8 \text{ kJ mol}^{-1}$$



$$\Delta_r H_o = + 890.3 \text{ kJ mol}^{-1}$$



$$\begin{aligned} \Delta H &= \Delta_r H_{o,1} + 2 * \Delta_r H_{o,2} + \Delta_r H_{o,3} \\ &= -393.5 + 2*(-285.8) + 890.3 = -74.8 \end{aligned}$$