

Answer on Question #75775 - Chemistry - Physical Chemistry

Question: Enthalpy change for the reaction $4\text{H}(\text{g}) \rightarrow 2\text{H}_2(\text{g})$ is -869.6kJ . The dissociation energy of H-H bond is;

(1) -434.8kJ

(2) -869.6kJ

(3) 434.8kJ

(4) 217.4kJ

Solution:

The standard energy of rupture of a chemical bond is the change in enthalpy in a chemical reaction, in which one mole of a given bond breaks. It is assumed that the initial substance and the reaction products are in their standard states of a hypothetical ideal gas at a pressure of 1 atm and a temperature of 25°C .

$$D = \Delta H_f$$

$$D = \frac{1}{2} \Delta H_f \text{ (one mole)}$$

$$D = -434.8\text{kJ}$$

Answer: (1) -434.8kJ .