Answer on Question #82204 – Chemistry – General Chemistry

What is the ΔH^0 for the following reaction (in kJ/mol of reaction exactly as written)?

$$C_6H_{12}O_6(s, \text{glucose}) + 6O_2(g) \rightarrow 6CO_2(g) + 6H_2O(l)$$

To solve, use Appendix II in your textbook (containing standard heats of formation).

Solution:

$\Delta H^0_{rxn} = \Sigma\Delta H^0_{f,\ products} - \Sigma\Delta H^0_{f,\ reactants}$

$C_6H_{12}O_6(s, \text{glucose}) + 6O_2(g) \rightarrow 6CO_2(g) + 6H_2O(l)$

$\Delta H^0(C_6H_{12}O_6(s)) = -1275.0$ kJ/mol

$\Delta H^0(O_2(g)) = 0$ kJ/mol

$\Delta H^0(CO_2(g)) = -393.5$ kJ/mol

$\Delta H^0(H_2O(l)) = -285.8$ kJ/mol

$\Delta H^0_{rxn} = 6 \times (-393.5) + 6 \times (-285.8) - (-1275.0) = -2361 - 1714.8 + 1275.0 = -2800.8$ kJ/mol