Chapter 6 - Lecture Worksheet 2 - Enthalpy of Reaction

From Exam 1 Spring 06

Add

14. In the lab it is fairly easy to obtain heats of combustion. Use this information and information from the other two reactions to determine the heat of formation of glucose (Reaction D).

(If you are running out of time you may just show the calculation and answer for this question. No detailed work necessary)

(A.) $C_6H_{12}O_6(s) + 6O_2(s)$	g)> $6CO_2(g) + 6H_2O(l)$ $\Delta H^o = -2808 \text{ kJ}$	
(B.) $C(s) + O_2(g)$	$\Delta H^{o} = -394 \text{ kJ}$	
(C.) $2 H_2O(l) \longrightarrow 0$	$D_2(g) + 2 H_2(g)$ $\Delta H^o = 572 \text{ kJ}$	
(D.) $6C(s) + 3O_2(g) + 3$	$6H_2(g)> C_6H_{12}O_6(s) \Delta H^0 = ?$	
Reverse Rxn A	$6CO_2(g) + 6H_2O(l) \longrightarrow C_6H_{12}O_6(s) + 6O_2(g)$	-(- 2808 kJ)
6 x Rxn B	$6C(s) + 6O_2(g)> 6CO_2(g)$	6(- 394 kJ)
Reverse Rxn C x 3	$3O_2(g) + 6H_2(g)> 6H_2O(l)$	(-3)(572 kJ)

(1) –1016 kJ (2) 1272 kJ (3) –1272 kJ (4) –3456 kJ (5) 3456 kJ (6) 3774 kJ (7) –1016 kJ

-1272 kJ

 $6C(s) + 3O_2(g) + 6H_2(g) - C_6H_{12}O_6(s)$

Define: Standard Formation Reaction:

A chemical reaction in which *one* mole of a *substance* in its *standard state* is made from it's *elements* in their standard states.

Write the standard formation reaction for H₂SO₄(1)

 $H_2(g) + S(s) + 2O_2(g) ----> H_2SO_4(l)$

Which of the following represent standard formation reactions ?

- (1) 2 C(s) + 3 H₂(g) + 1/2 O₂(g) ---> C₂H₅OH (l)
- (2) $CaO(s) + CO_2(g) \rightarrow CaCO_3(s)$
- (3) $Pb^{+2}(aq) + CO_3^{-2}(aq) \longrightarrow Pb CO_3(s)$
- (4) $C_2H_5OH \rightarrow 2C(s) + 3H_2(g) + \frac{1}{2}O_2(g)$
- (5) $2 \operatorname{Fe}(s) + 3/2 \operatorname{O}_2(g) \longrightarrow \operatorname{Fe}_2 \operatorname{O}_3(s)$
- (6) 1 and 2
- (7) 1, 2, 3, and 5
- (8) 1, 3, and 5
- (9) 1 and 5
- (0) All of the reactions, 1-5 represent standard formation reactions.