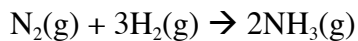


LECTURE 15

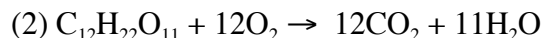
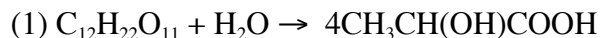
1. Using the following bond enthalpy table, calculate the estimated enthalpy of reaction for the following reaction:



N-N	163 kJ/mol	N-H	391 kJ/mol
N=N	418 kJ/mol	H-H	436 kJ/mol
N≡N	941 kJ/mol		

$$\Delta H_{\text{rxn}} = -97 \text{ kJ/mol}$$

2. The anaerobic conversion of sucrose ($\text{C}_{12}\text{H}_{22}\text{O}_{11}$) to lactic acid ($\text{CH}_3\text{CH}(\text{OH})\text{COOH}$) is shown in equation (1). The combustion of sucrose is shown in equation (2).



Calculate the standard reaction enthalpy for each reaction using the following enthalpy of formation data: $\Delta H_f^\circ = -694 \text{ kJ/mol}$ for lactic acid, $\Delta H_f^\circ = -2222 \text{ kJ/mol}$ for sucrose, $\Delta H_f^\circ = -393.5 \text{ kJ/mol}$ for CO_2 , $\Delta H_f^\circ = -286 \text{ kJ/mol}$ for H_2O .

$$\Delta H_{\text{r}(1)}^\circ = -268 \text{ kJ (or kJ/mol)}$$

$$\Delta H_{\text{r}(2)}^\circ = -5646 \text{ kJ (or kJ/mol)}$$

Additional Book Problems:

Atkins and Jones, Chemical Principles, fourth edition:

Chapter 6, Self-Test 6.18A&B, problem 6.62 & 6.63, 6.86 & 6.87

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5.111 Principles of Chemical Science
Fall 2014

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