Name _____ Date _____ Period _____

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6.7 Bond Enthalpies

AP Chemistry

Show work with units. ΔH = (bond enthalpies broken) − (bond enthalpies formed).

Bond enthalpies (kJ/mol)	H−H 436	C−H 413	O−H 463	N−H 391	O=O 495
	C−C 348	C=C 614	C≡C 839	C=O (in CO_2) 799	N≡N 941

1. Estimate ΔH for $2H_2(g) + O_2(g) \rightarrow 2H_2O(g)$ using bond enthalpies.

2. Draw the Lewis structures, then estimate ΔH for $C_2H_4(g) + H_2(g) \rightarrow C_2H_6(g)$.

3. Draw the Lewis structures, then estimate ΔH for $C_2H_2(g) + 2H_2(g) \rightarrow C_2H_6(g)$.

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4. The measured ΔH for $2H_2(g) + O_2(g) \rightarrow 2H_2O(g)$ is $-484\ kJ/mol_{rxn}$. Use this value with the H−H and O−H bond enthalpies to calculate the O=O bond enthalpy.

5. A student writes, “Energy is released when a bond breaks.” Correct this statement.

6. A C=C bond enthalpy is 614 kJ/mol and a C−C bond enthalpy is 348 kJ/mol. Is a C=C bond twice as strong as a C−C bond? What does this tell you about using bond enthalpies?

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