Dougherty Valley HS Chemistry - AP
Thermochemistry – Bond Energy Practice 1

Worksheet #9

Name: **Period:** **Seat#:**

Directions: Show all work in a way that would earn you credit on the AP Test! This is always the rule! Some answers are provided at the end in italics and underlined. If you need more space, use binder paper and staple to your worksheet.

Average Bond Enthalpies (kJ/mol)

Single Bonds

C—H	413	N—H	391	O—H	463	F—F	155
C—C	348	N—N	163	O—O	146		
C—N	293	N—O	201	O—F	190	Cl—F	253
C—O	358	N—F	272	O—Cl	203	Cl—Cl	242
C—F	485	N—Cl	200	O—I	234		
C—Cl	328	N—Br	243			Br—F	237
C—Br	276			S—H	339	Br—Cl	218
C—I	240	H—H	436	S—F	327	Br—Br	193
C—S	259	H—F	567	S—Cl	253		
		H—Cl	431	S—Br	218	I—Cl	208
Si—H	323	H—Br	366	S—S	266	I—Br	175
Si—Si	226	H—I	299			I—I	151
Si—C	301						
Si—O	368						

Multiple Bonds

C=C	614	N=N	418	O_2	495
C≡C	839	N≡N	941		
C=N	615			S=O	523
C≡N	891			S=S	418
C=O	799				
C≡O	1072				

1) In general, how do bond energies of single, double, and triple bond compare? Explain.

2) When chemical bonds break, energy is _____.

3) When chemical bonds form, energy is _____.

4) Find the enthalpy (ΔH) for the <u>unbalanced</u> reactions that follow. Make sure to write the balanced eq. first, and draw Lewis Structures to help you determine the bonds broken/formed if you don't know what it looks like off the top of your head!

a. Combustion of methane (CH_4) *<u>-808 kJ/mol</u>*

b. Formation of water *-485 kJ/mol*

c. Formation of hydrochloric acid *-184 kJ/mol*

d. _____CH_4 + _____Cl_2 → _____CH_3Cl + _____HCl *-104 kJ/mol*

e. _____CH_4 + _____Cl_2 → _____CH_2Cl_2 + _____HCl *-19 kJ/mol*