AP Chemistry
Bond Energy Problems

The following problems should be tried using the data that was calculated in the lecture outline. The most relevant reactions are there. You may use the thermodynamic data tables that are on the website to look up relevant reactions. Once you have calculated the energy of a specific bond (like carbon to hydrogen in the lecture) you may use it for subsequent questions. All of the reactions for these questions come down to what we have (humorously) called ΔH°_{kaboom}.

1) Calculate the bond energy of a hydrogen-oxygen bond in a water (H_2O) molecule.

2) Calculate the bond energy of a hydrogen-nitrogen bond in an ammonia (NH_3) molecule.

3) Calculate the bond energy of a carbon-chlorine bond in a carbon tetrachloride (CCl_4) molecule.

4) Calculate the bond energy of a carbon-sulfur bond in a carbon disulfide (CS_2) molecule.

5) Calculate the bond energy of a carbon-oxygen double bond in a carbon dioxide (CO_2) molecule.

6) Calculate the bond energy of a carbon-oxygen double bond in a $COCl_2$ molecule.

7) Calculate the bond energy of a carbon-nitrogen triple bond in a hydrogen cyanide (HCN) molecule.

8) Calculate the bond energy of a carbon-oxygen single bond in an methanol (CH_3OH) molecule.

9) Calculate the bond energy of a carbon-oxygen double bond in a CH_3CHO molecule.

10) In three different problems you calculated the energy of a carbon-oxygen double bond. Did you get the same answer each time? What might lead to the differences?