Due: **Monday, 10-November-2003** at the beginning of class. Early submissions are welcome, as always.

1) Use bond energies to estimate $\Delta H$ for the reaction (*Hint*: try drawing the molecules first):

$$\text{CH}_2\text{CHCN} + 3\text{H}_2(\text{g}) \rightarrow \text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$$

2) A compound of antimony and fluorine is a gas. A sample of mass 0.1500 g occupies 16.98 mL at 24°C and 755 mm Hg. What is the molecular weight of the compound? Write the Lewis formula for the compound?

3) Assume the values of the C-H and C-C bond energies given in your text in Table 9.5. Then using data from Appendix C in your text, calculate the C=O bond energy in acetaldehyde

$$\text{H}_3\text{C}-\text{C}=\text{O}$$

4) According to Pauling, the A-B bond energy is equal to the average of the A-A and B-B bond energies, plus an energy contribution from the polar character of the bond:

$$\text{BE}(A-B) = \frac{1}{2} [\text{BE}(A-A) + \text{BE}(B-B)] + k(X_A - X_B)^2.$$  

Here $X_A$ and $X_B$ are the electronegativities of atoms A and B respectively, and $k = 98.6$ kJ. Assume the electronegativity of fluorine is 4.0, and, using data from Table 9.5 in your text, calculate the electronegativity of sulfur (*Hint*: be careful!) (*Second Hint*: Figure out what compound you are working with.)

5) Two terms that we throw around a lot are electronegativity and electron affinity. On first look, these would seem to be nearly identical; yet they are distinct. How does electronegativity differ from electron affinity?