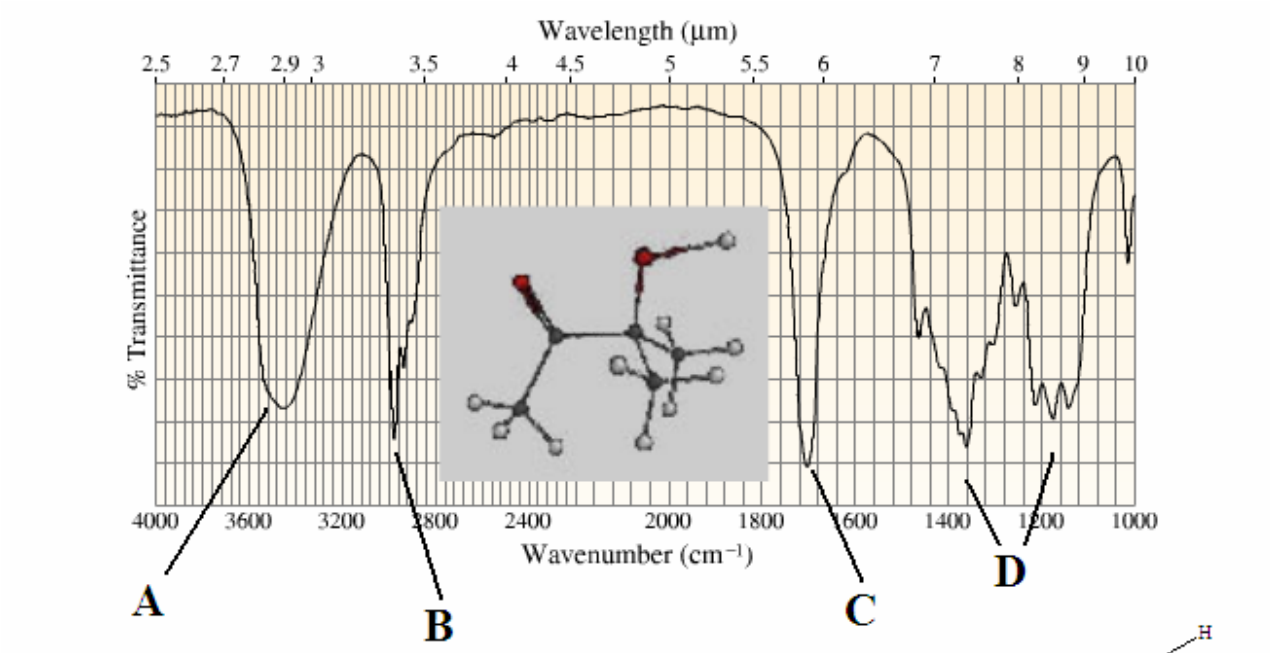
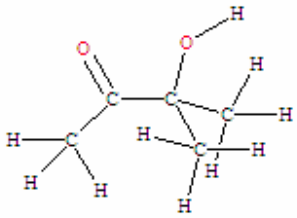
Infrared Spectroscopy

In an infrared spectrometer, a sample is placed in a beam of infrared light. A measurement is made of how much light is transmitted through the sample. The y-axis of the spectrum is "% Transmittance," with 100% at the top (fully transmitted light, no absorption) and 0% at the bottom (complete absorption).

To view the simulation, go to http://www.stolaf.edu/people/hansonr/imt/js/ir/ir.htm



Note: All vibrations are HIGHLY exagerated! Actual displacements are on the order of 1/10 that shown.



Source:http://ajax.prenhall.com/~bookbind/books/bruice2/book/chapter12/medialib/flash/page7.htm

Questions to think about:

1. Look at the top scale. Which end of the spectrum is at low energy? high energy?

2. What would the spectrum of a substance look like if the substance were transparent in the IR?

3. What would the spectrum of a substance look like if the substance were opaque in the IR?

4. How would you describe the vibrations attributable to absorptions A, B, C, and D?

5. Rationalize the order of energy A > B > C > D based on bond strength and reduced mass. (Note: OH bonds are stronger than CH bonds due to the partial ionic character of the OH bond.)