

Announcements

- Turn on the Clicker (the red LED comes on).
- Push “Join” button followed by “20” followed by the “Send” button (switches to flashing green LED if successful).
- Kinetics lab handout will be available in the lab handout section of the class web site by Wednesday.
- Exam 1
 - Average: ~65%
 - One question gave more than $\frac{1}{2}$ the class problems: If a book falls off a table, what type of energy does the book possess while it is falling. (The answer is potential and kinetic energy).
- Quiz tomorrow Sections 12.7-13.3.

Review

- Coal and hydrogen as fuel
 - older coal higher energy content less O primarily.
 - H₂ high fuel value (kJ/g) but low density gas, hard to handle (possible solutions, adsorb or do chemistry on it).
- Alkenes (hybridization, shape, naming, cis- vs. trans-).
- Alkynes (hybridization, shape, naming).
- Combustion analysis (elemental analysis).

Entropy & Free Energy (Ch 13)

- Enthalpies of Solution (ΔH_{ionic} , $\Delta H_{\text{H-bonds}}$, $\Delta H_{\text{ion-dipole}}$, ΔH_{hyd} , Lattice Energy)
- Entropy (S, ΔS , spontaneity)
- Free Energy (ΔG)
- Carbohydrates, Proteins and Lipids (peptide bond, stereoisomerism)
- ΔG in biochemical reactions.
- DNA and making proteins.

Table 13.1

Second Law of Thermodynamics

- A process is spontaneous only if the entropy of the universe increases during the process.
- Entropy is times arrow, as time moves forward entropy increases.
- Spontaneous Process: $\Delta S_{\text{univ}} > 0$
- Non-spontaneous Process $\Delta S_{\text{univ}} < 0$
- $\Delta S_{\text{univ}} = \Delta S_{\text{sys}} + \Delta S_{\text{surr}}$.