AP Chemistry

Reading Guide—Solutions and Semiconductors

A. Solution Process

Read pp. 528-537 in your textbook

Define/explain the following

- Solvation

- Hydration

- Picture models of the solution process

- Energy changes & solution process (3 steps)

Carefully watch the following animation and answer the questions.

http://group.chem.iastate.edu/Greenbowe/sections/projectfolder/flashfiles/thermochem/solutionSalt.html

- Describe the changes you observe in the animation, including changes in the bonds and particulate attractions and changes in the amount of disorder in the system.

- When sodium chloride is dissolved in water, the temperature of the resulting solution is lower than the temperature of the water before the salt dissolves. How can this result be explained based on the bond breaking and bond making that is occurring?

- Why do some salts, such as sodium chloride, dissolve spontaneously even though the process is endothermic overall?

- When some ionic salts are dissolved in water, the temperature of the resulting solution is higher than the temperature of the water before the salt dissolves. What do you think determines whether the resulting solution is cooler or warmer than the starting water?

Look at these animations, too

- Melting of Ice Simulation
- Large salt crystal in water (water shown)
- Large salt crystal in water (water hidden)

Compare information from textbook and animations…

B. Semiconductors—pp. 482-488

Read pp. 482-488 in your textbook

Compare the band structure of bulk solids—

- metals
- semiconductors
- insulators

Illustrations comparing band structure
http://www.doitpoms.ac.uk/tlplib/semiconductors/energy_band_intro.php
http://en.wikipedia.org/wiki/Electronic_band_structure scroll down to find videos

Metals Semiconductors Insulators

Band gap

Define the following:

- Elemental semiconductors

- Compound semiconductors

- Valence band

- Conduction band

Summarize periodic trends re. band gaps

- Group trend

- In compound semiconductors

What is doping? See also http://pveducation.org/pvcdrom/pn-junction/doping

Compare and contrast: (include illustrations)

p-type semiconductors

n-type semiconductors