Announcements

To join clicker to class today (Clickers with LCD display join automatically):

- 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).

- Quiz in discussion today.
- Will be starting a new section on Friday. Suggested reading mailed out tomorrow.

- PICK UP PAPER COPY OF PERIODIC TABLE IF YOU DON'T HAVE ONE TO DRAW ON.

Review

- Bohr Atom
  - $E_n = -R_H/n^2$ ($R_H = 2.179 \times 10^{-18}$ J/atom)
  - Use E_n to calculate $\Delta E = E_f - E_i$ for transitions
  - had problems solved by wave-particle duality
    - modelled by deBroglie eq. $\lambda = h/mv$
    - electrons are standing waves around nucleus
- Full quantum mechanics gives wave functions (ψ)
  - orbitals show probable location of electrons (ψ^2)
  - shapes of s=sphere,p=dumb bell,d and f =complex
  - nodes are places where there is no probability of finding an electron which is in that orbital.

Review

- Quantum #'s
  - n (principle) = 1, 2, 3 ...∞ (specifies shell) KNOW
Priniciple QN n	# of s orbitals	# of p orbitals	# of d orbitals	# of f orbitals
1	1			
2	1	3		
3	1	3	5	
4	1	3	5	7
5	1	3	5	7
6	1	3	5	7
  - l specifies orbital type s, p, d f.
  - m_s specifies which p, d or f you are in.

1s Orbital

Chang Fig 7.15 & 7.16

p-orbitals

Chang Fig. 7.17

Quantum # Rules

- Pauli Exclusion Principle: No two e^- in the same atom may have all four quantum numbers the same.
- n (principle) = 1, 2, 3 ...∞ (specifies shell)
- l (angular momentum QN) = 0, 1, ...n -1 (0=s,1=p, 2=d, 3=f)
- m_l(magnetic QN) = 0, ±1, ... ±l.
- m_s=±1/2
- SUMMARY: each orbital can hold at most two electrons

Magnetic Properties

- Paramagnetic: unequal number of spin-up and spin-down electrons. Attracted to a magnet.
- Diamagnetic: equal number of spin-up and spin-down electrons. Not attracted to a magnet.

Energy level order

Chang Fig. 7.20

Fig. 3.26: Subshell Blocks

Shielding/Penetration

Chang 7.23