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 Wednesday on material since last exam, including most of today's lecture.

Review

- History of atomic models:
- e^- embedded in positive sphere (~1900)
- Rutherford Exp (1910) = dense nucleus (+) and e^- somewhere outside
- Photoelectric effect, emission and absorption line spectra suggested that e- are trapped in quantized energy levels.
- Practiced calculating ΔE of a transition between quantum states. Ex: photon of 3.5×10^{-19} J was emitted ($\Delta E < 0$)

Chang Fig. 7.7 and 7.9 for alternative representations

Bohr Atom

$$E_n = -R_H/n^2=(-2.179 \times 10\text{-}18\ J)/n^2$$

Know of this model. HOWEVER, WE WILL NOT USE IT BECAUSE IT ONLY WORKS FOR HYDROGEN AND DOES NOT EXPLAIN WHY THESE ENERGY LEVELS EXIST.

Standing waves

Chang Figs. 7.10&11

Electron diffraction by thin graphite

Similar to
Chang
Fig. 7.12

http://www.physics.montana.edu/demonstrations/video/7_modernphysics/demos/electrondiffraction.html

Quantum # for specifying orbitals

- 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.

Chang Table 7.2