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).

Announcements

" Pick up a paper periodic table if you do not have one with you that you can write upon.

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

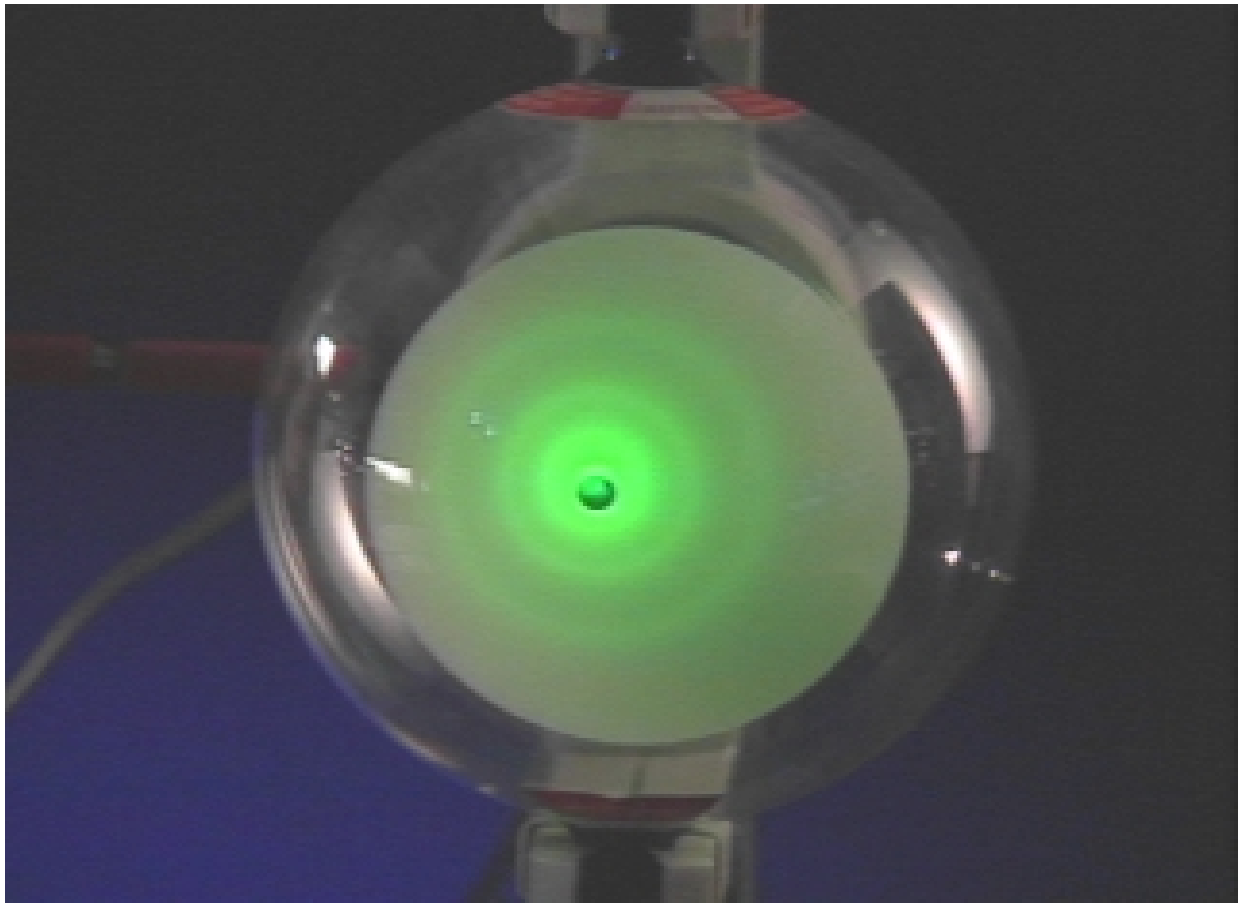
Bohr Atom

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

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.

Electron diffraction by thin graphite

Similar to Chang Fig. 7.12



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

Standing waves

Chang Figs. 7.10&11

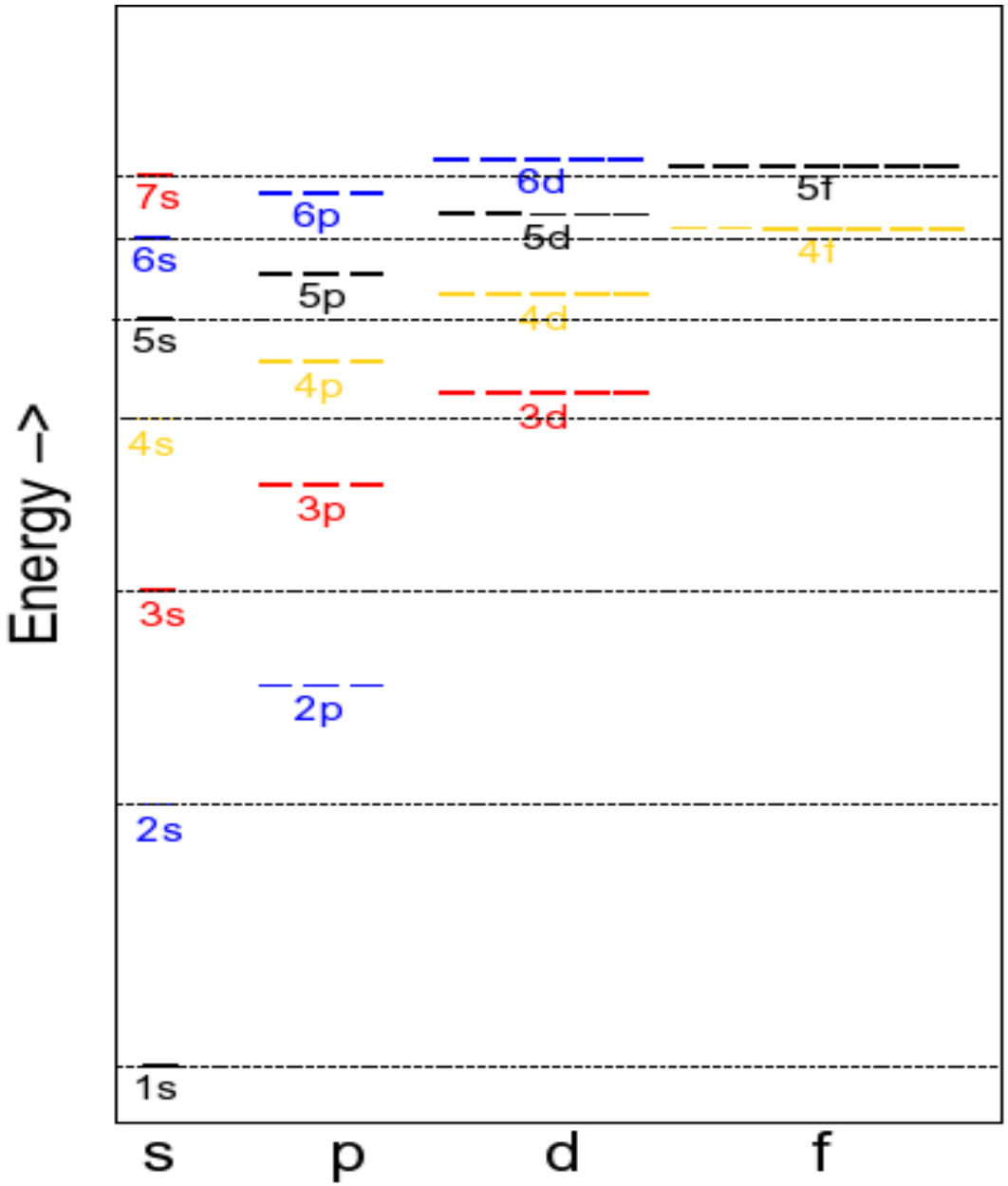
Quantum # for specifying orbitals

- 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

Energies of Orbitals in Many Electron Atoms

(similar to Chang Figure 7.20)



1s Orbital

Chang Fig 7.15 & 7.16

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

Energies of Orbitals in Many Electron Atoms

(similar to Chang Figure 7.20)

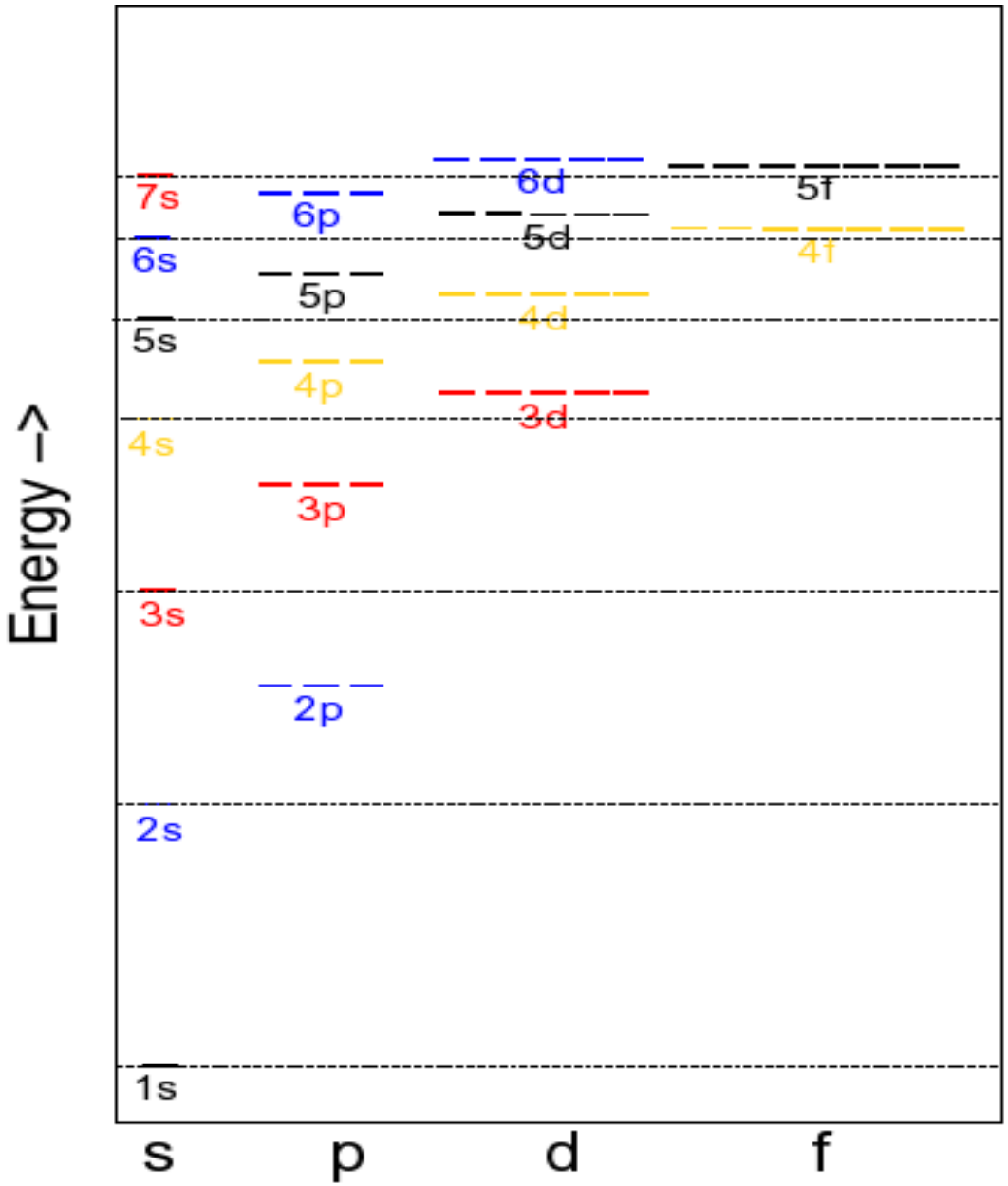


Fig. 3.26: Subshell Blocks

Shielding/Penetration

Chang 7.23