

**Ch. 13** electron configuration.

wavelength	frequency
amplitude	electromagnetic spectrum
emission spectra	absorption spectra
Hund's Rule	Aufbau Principle
Pauli Exclusion Principle	DeBroglie and Planck's formula
Wave-Particle Duality theory	Quantum numbers (n, l, m, s)
orbitals (s, p, d, f)	c= speed of light= $3 \times 10^{10}$ cm/sec
photoelectric effect	quanta
Heisenberg's Uncertainty Principle	orbital diagrams

**Chapter 14:** The periodic chart:

alkali	halogen
alkaline earth	noble gas
family/group	period/row
metals/nonmetals	actinides
stairstep line	Mendeleev
ionization energy	lanthanides
atomic vs. ionic size	transition metals
electronegativity	inner transition metals
Valence electrons p. 413 next chapter	Noble gas core configuration

II. Equations to know:

They will be given on the test

$$\lambda = h/mv$$

$$h = 6.63 \times 10^{-34} \text{ Jsec or } (\text{kg m}^2/\text{s})$$

$$\text{so } h = 6.63 \times 10^{-34} \text{ kg}\cdot\text{m}^2/\text{sec}$$

$$E = h\nu$$

$$c = \lambda \nu \quad c = 3 \times 10^{10} \text{ cm/sec}$$

**Chapter 13:**

- Be able to give the complete electron configuration of any atom OR ION. Long and noble gas core style – my choice.
- Be able to tell the maximum number of electrons you can have in any given energy level  $2(n^2)$ .
- Know how many of each orbital there are: 1 s, 3 p, 5 d, 7 f.
- Be able to calculate wavelength or frequency as in homework #11,12,49,50 or worksheet.
- Be able to calculate using the other two formulas also as in homework # 13,14,38,44, 51 or worksheet.

**Ch. 13 Practice:**

- 1) If three electrons occupy the 2p orbitals, how many are unpaired? How do you know how many boxes there are?
- 2) If 6 electrons occupy d orbitals how many are unpaired?
- 3) How does the energy of an electron change when the electron moves closer to the nucleus? (increase or decrease?)
- 4) How many sublevels are there in the third principal energy level? And within those sublevels, how many orbitals are there? (Just vocabulary: principal energy level = row. Sublevels = types of orbitals etc)
- 5) Which color of visible light has the shortest wavelength which means the highest energy? ROYGBIV The longest which is the lowest energy so smallest quantum leap?
- 6) How does the speed of visible light compare to gamma rays if both are measured in a vacuum?(trick)
- 7) In a neon light, what are the electrons doing when light is given off? Going up in energy or down? In the flame test lab, when did you see color? What were the electrons doing?
- 8) In a certain atom with all its electrons in the ground state, the first and second energy levels are totally filled. In the third energy level the s and p sublevels are filled. In the fourth level, the s sublevel is filled. All the other sublevels are empty. Write the electron configuration and identify the element.