AP CHEMISTRY CHAPTER 7 OUTLINE

ATOMIC STRUCTURE AND PERIODICITY

7.1 ELECTROMAGNETIC RADIATION

Wavelength (λ)

Frequency (ν)

Speed (c)

Relationship between the above

7.2 THE NATURE OF MATTER

Planck’s Constant

Quantum

Photons

Theory of relativity

Dual Nature of Light and the de Broglie’s equation

7.3: THE ATOMIC SPECTRUM OF HYDROGEN

Continuous Spectrum

Line Spectrum

What does the line spectrum mean?

7.3: THE BOHR MODEL

Quantum Model

Ground State

Important points about the Bohr Model and its limitations

1.

2.

3.

7.5: THE QUANTUM MECHANICA MODEL OF THE ATOM

Quantum mechanics

Heisenberg uncertainty principle

Orbital

7.7: ORBITAL SHAPES AND ENERGIES

See pictures 315-317

Degenerate orbitals

Ground State

Excited State

7.8: ELECTRON SPIN AND THE PAULI PRINCIPLE

Electron spin quantum number (ms)

Pauli Exclusion Principle

7.9: POLYELECTRONIC ATOMS

Electronic correlation problem

Effective nuclear charge

7.10: THE HISTORY OF THE PERIODIC TABLE

7.11: THE AUFBAU PRINCIPLE AND THE PERIODIC TABLE

Aufbau principle

Orbital diagram

Hund’s rule

Valence electrons

Core electrons

Transition metals

Additional Points about Electron Filling

1.

2.

3.

4.

5.

7.12: PERIODIC TRENDS IN ATOMIC PROPERTIES

Ionization energy

First ionization energy

Second ionization energy

Third ionization energy

Electron affinity

Atomic Radius

7.14: THE PROPERTIES OF A GROUP: THE ALKALI METALS

Information contained in the periodic table

1.

2.

3.

4.

The Alkali Metals