

Unit 6 Reading Assignment

Learning Objectives in this Unit:

- Describe the implications of wave mechanics and the quantization of electron energies and spin, including quantum numbers, atomic orbital energies, and the shapes of s, p and d orbitals
- Write full and condensed electron configurations, differentiate between core and valence electrons, draw orbital diagrams
- Explain the organization of the periodic table, group names, trends in metallic character, atomic radius, ionization energy, electron affinity, and electronegativity
- The Bohr Model and electromagnetic radiation

Read more about these topics: [Chapter 6](#)

1. Consider the following types of electromagnetic radiation: X-Ray, Visible, Radio, Microwave, Infrared, Ultraviolet, Gamma
 - a. Order them in terms of increasing wavelength
 - b. Order them in terms of increasing frequency
2. Fill in the blank with either “inversely” or “directly”
For electromagnetic radiation, wavelength is [_____] proportional to frequency and [_____] proportional to energy.
3. Fill in the blanks with either “emitted” or “absorbed”
According to the Bohr model of the atom:
Electrons move to an orbit with a higher n when a photon is [_____] by an atom
Electrons move to an orbit with a lower n when a photon is [_____] by an atom
4. Which of the following is a limitation of the Bohr model of the atom?
 - a. It cannot explain the discrete line spectra of elements
 - b. It assumes that electrons exist in quantized energy levels
 - c. It cannot explain the behavior of multi-electron atoms, such as Helium
 - d. It assumes that an electron’s energy increases with increasing distance from the nucleus

5. Match the quantum number to what it describes about an orbital

Principle quantum number (n)	describes the relative spatial orientation of an orbital
Angular moment quantum number (l)	describes the location and energy level of a shell
Magnetic quantum number (m_l)	describes the shape of the orbitals in a subshell

6. Fill in the blanks.

The Pauli exclusion principles: no two [_____] in the same atom can have exactly the same set of all the four [_____] numbers.

This means that only [_____] electrons can share the same orbital.

7. Rank the subshells in terms of increasing energy level with a shell: f,s,d,p

Unit 6 Reading Assignment

8. Match the following terms to their definitions

Valence Electrons	electrons occupying the outermost shell orbital(s)
Core Electrons	electrons occupying the inner shell orbital(s)

9. Indicate whether the following statement is true or false

There are exceptions to the Aufbau principle when assignment electron configurations to elements

10. Fill in the blank with either “decreases” or “increases” or “smaller” or “larger”

Atomic radius generally [_____] from left to right across a period and [_____] down a group.

Cations have a [_____] radius than the atom from which it is derived.

Anions have a [_____] radius than the atom from which it is derived.