

Unit 9: Electron Arrangement

(Links go to review videos.)

1) Electron Arrangement -- General Organization

- a) I understand the general energy structure that exists in the electron cloud and can use the vocabulary correctly:
 - i) The electron cloud can be divided into Energy Levels.
 - ii) Energy levels are composed of sublevels.
 - iii) Sublevels are made up of orbitals.
 - iv) Any electron orbital can contain two and only two electrons.
- b) I understand that orbital shapes, numbers, and energies follow a distinct and organized system.

2) Quantum Numbers -- Definitions

- a) I can identify the variable, definition, and range of each of the four quantum numbers.
- b) I understand how quantum numbers relate to atomic numbers on the modern periodic table.
- c) I can assign quantum numbers to specific electrons.

3) Quantum Numbers -- Calculation

- a) I understand how the four quantum numbers interrelate.
- b) I can evaluate possible values of one quantum number, based on another. I.e., I can give the number of sublevels, orbitals, and electrons possible for various values of n , and identify incorrect combinations of quantum numbers based on an understanding of how energy level, sublevel, orbital, and spin are related.

4) Electron Configurations (Essential)

- a) I understand the relationship between quantum numbering and electron configuration.
- b) I can assign electron configurations for ground-state atoms.

5) Rules of Configuration, Orbital Diagramming (Essential)

- a) I can identify the patterns present in completed orbital diagrams and use them to generalize the system in which electrons organize themselves.
- b) I understand the three primary laws governing electron organization in an atom and can identify violations to these rules in orbital diagrams and by description.
 - i) The Aufbau Principle
 - ii) Hund's Rule
 - iii) The Pauli Exclusion Principle