

## Unit 2 – Atomic Structure

## STUDY GUIDE

*Chapter 4 – Atomic Structure*

*Chapter 5 – Electrons in Atoms*

*Chapter 6 – The Periodic Table*

### Vocabulary

- Atom
- Atomic Mass
- Atomic Number
- Isotopes
- Mass Number
- Proton
- Neutron
- Electron
- Wavelength
- Amplitude
- Frequency
- Ground state
- Excited state
- Photons
- Atomic orbitals (s, p, d, f)
- Energy levels (n=)
- Electron configuration
- Orbital notation
- Aufbau principle
- Pauli exclusion principle
- Hund's rule
- Anion
- Cation
- Atomic Radius
- Ionization Energy
- Electronegativity

### Equations

$$c = \lambda f$$

$$c = 3.00 \times 10^8 \text{ m/s}$$

$$\# \text{ neutrons} = \text{mass \#} - \text{atomic \#}$$

$$\text{average} = \frac{(\% \text{ abundance} \times \text{mass number}) + \text{other isotopes}}{\text{atomic mass}}$$

### Core Concepts

- Atomic Models – Scientists & experiments used to construct modern atomic structure
- 3 types of subatomic particles
- Finding the number protons, neutrons & electrons in an atom using atomic number and mass number
- Isotopes of atoms
- Calculating average atomic mass of an element
- Law of Conservation of Mass
- Energy levels (n=) contain sublevels (s, p, d, f) which contain electrons. Know the number of electrons that all of the sublevels contain.
- 3 rules for filling electrons (Aufbau principle, Pauli exclusion principle, Hund's rule)
- Writing electron configuration (long & shorthand)
- Writing orbital notation
- Light is a wave or a particle
- What happens to electrons that gain energy?
- Groups/family names on the periodic table
- Octet Rule
- Lewis dot structures
- Ion charges and electron configurations for ions
- Trends of the periodic table (atomic radius, ionization energy, ion size, electronegativity)