

# Exam 3 Study Guide

November 14, 2023

This is a checklist based on the lecture and textbook materials. It is not expected to be an all encompassing study guide and provides a guideline for your studies.

## Chapter 8: The Quantum Model of the Atom

- Relationship wavelength  $\lambda$ , frequency  $\nu$ , and speed of light  $c$
- Relationship between light energy and frequency and wavelength
- Electromagnetic spectrum (Radio waves, Microwaves, IR, visible light, UV vis, X-ray, and gamma rays)
- Bohr Model of the atom and its limitation
- Rydberg equation
- Quantum numbers ( $n, l, m_l, m_s$ ) and atomic orbitals
- Heisenberg Uncertainty principle, Pauli Exclusion principle, Aufbau principle, and Hund's rule
- Electron configurations (long and short handed)

## Chapter 9: Periodic trends

- Valence and core electrons
- Atomic and ionic radius
- Electronegativity trends
- Ionization Energy and Electron Affinity

## Chapter 10: Covalent Bonding

- Lewis structure and steps to draw compounds
- Octet rule and exceptions to the octet rules
- Resonance structures and hybrid structure

- Nonpolar/Polar bonds and electronegativity

## **Chapter 11: Molecular Shape**

- Define VSEPR Model
- Electronic arrangement/structure and Geometric Structure
- Nonpolar/Polar molecules