Chapter 5 - Structure of Atoms

- fundamental particles (p, n, e) in atoms and ions
- Rutherford Experiment
- atomic number (\( Z \)), mass number \( A \), \( A = Z + E \)
- atomic weight (weighted average of isotopes)
- relationship between \( c, \lambda, E, h \)
  \[ c = \lambda \nu \quad E = h \nu = h c / \lambda \]
- Bohr atom
- quantum mechanics - Heisenberg Uncertainty Principle
  - quantum numbers (\( n, l, m, m_s \))
  - Pauli Exclusion Principle
- electronic configuration of atoms (Hund's Rule)
- filling orbitals - s, p, d, f (exc. Cu+, Cr)
- diamagnetic vs paramagnetic
- maximum # electrons in major energy level = \( 2n^2 \)
- atomic orbital representations (pictures)
  \[ s \quad p_x, p_y, p_z \quad d_{z^2}, d_{x^2-y^2}, d_{xy}, d_{xz}, d_{yz} \]
- relationship between quantum numbers, electronic configuration, & periodic table.