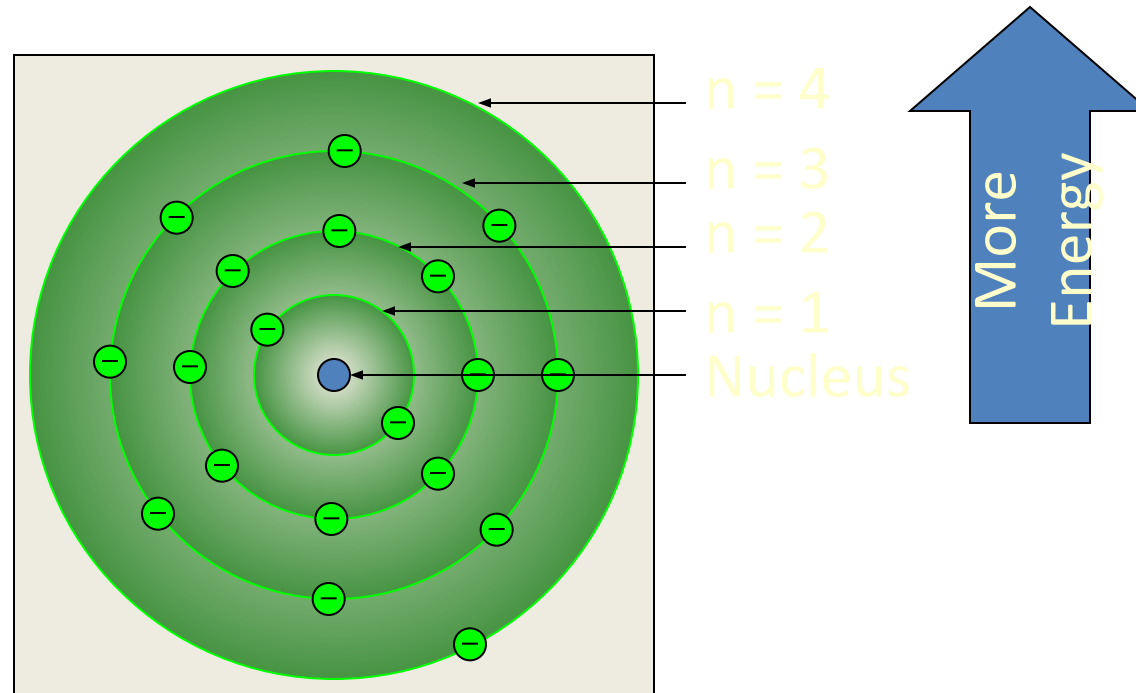


Electron Configuration

Electron Structure

- In a **neutral** atom, electrons = atomic number.
- Electrons are arranged into energy levels.
- Energy Level (shell) defines how far the electron is away from the nucleus.



Simple model of a potassium atom

Electron Arrangement

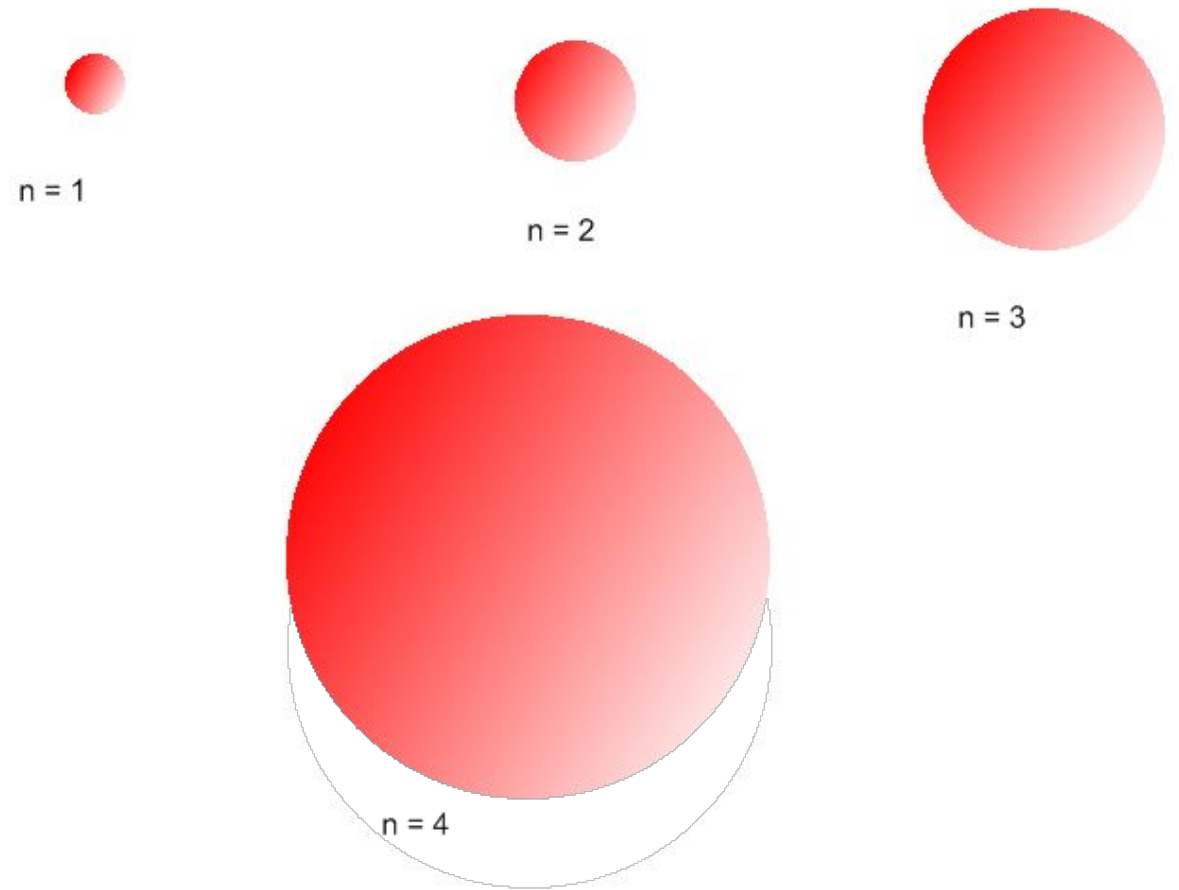
Aufbau Rule: electrons fill into the lower energy orbitals before moving to higher energy orbitals

Hund's Rule: one electron must be in each position of an orbital before they are paired

Pauli exclusion principle: no two electrons can have the same set of quantum numbers (define properties of e^-)

- Principle Quantum number: Energy Level (shell) defines how far the electron is away from the nucleus.

Bohr Model rings

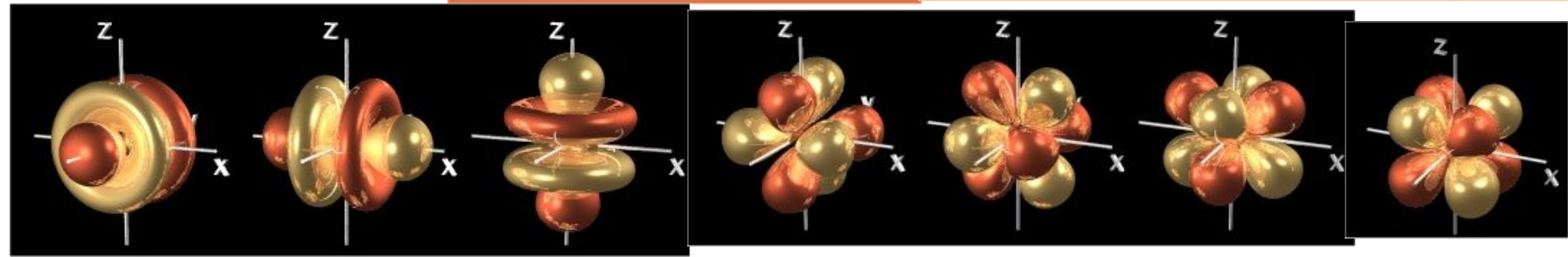
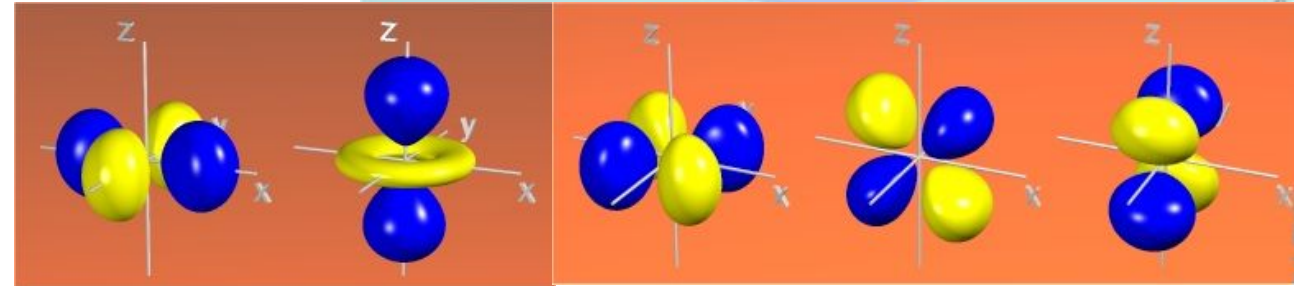
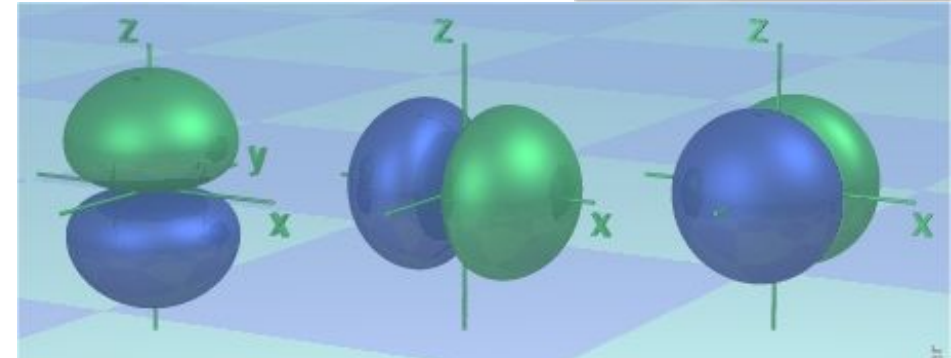
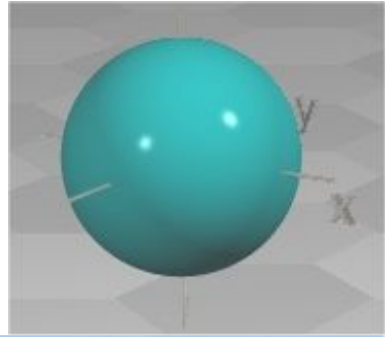


Orbitals

- Orbital quantum number: defines the shape of orbital

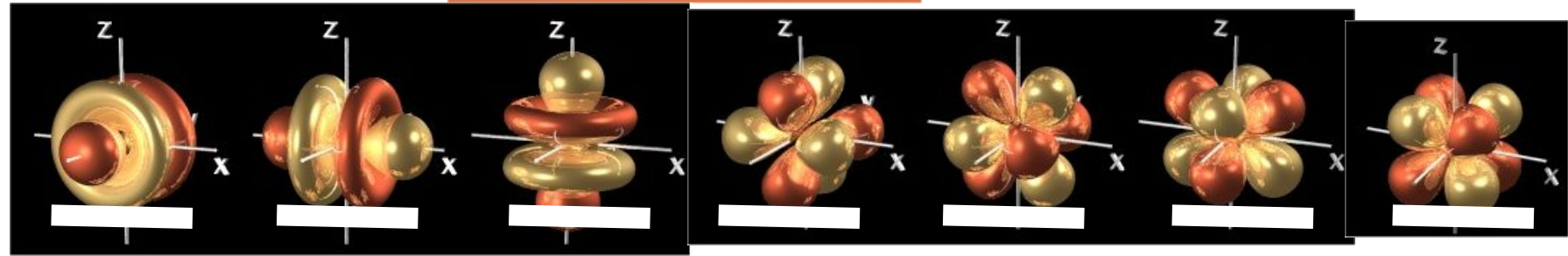
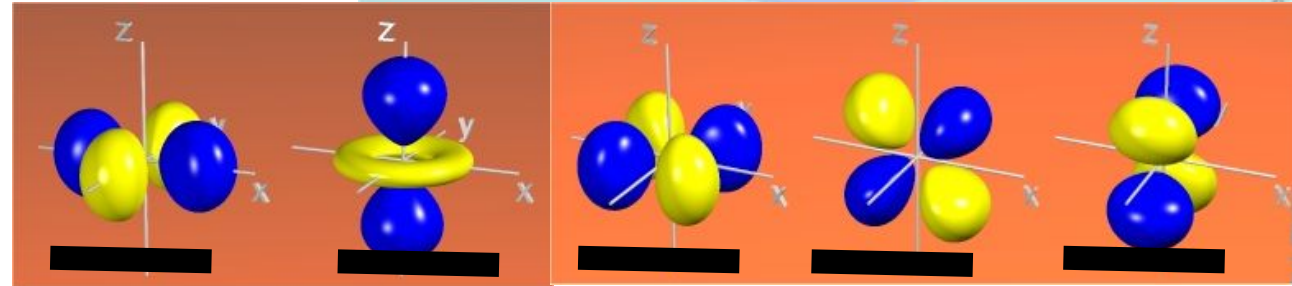
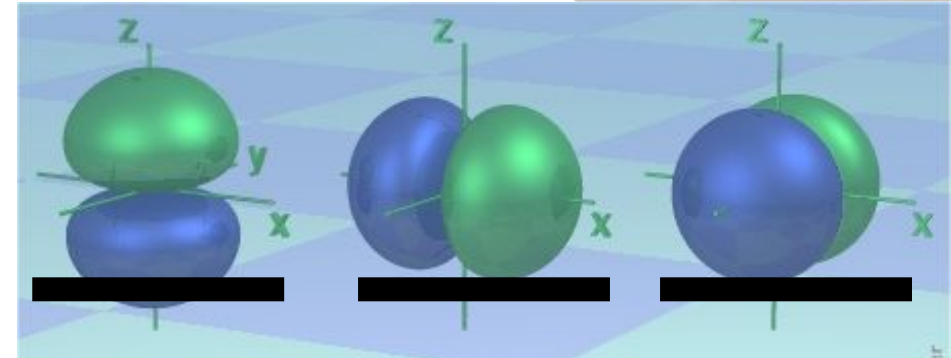
– Four types:

- s
- p
- d
- f



Magnetic quantum number: defines the orientation in space of the orbital (number of available spaces (positions) for electrons to fill)

- Two electrons can fill each position
- How many electrons can each orbital hold?



Electron Spin

Spin Quantum number: designates direction of electron spin (must be spinning in opposite directions).

- Each orbital can hold up to 2 electrons.
- Why only 2 in each orbital?
 - Spin up
 - Spin down

Electron Structure

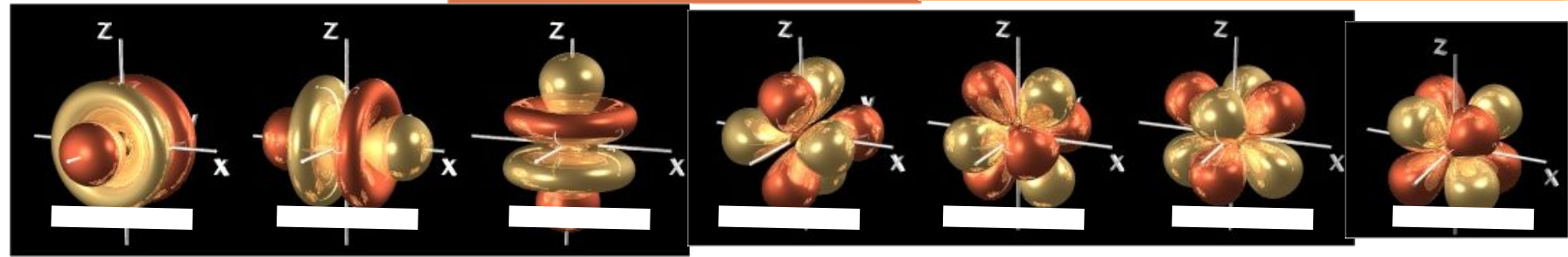
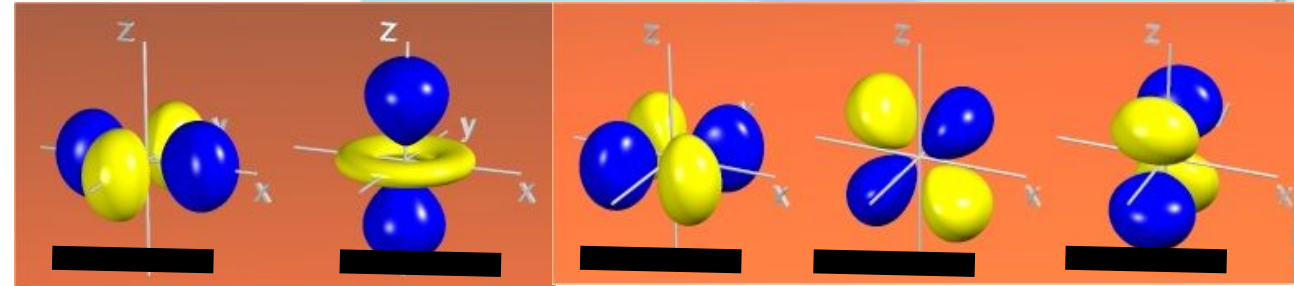
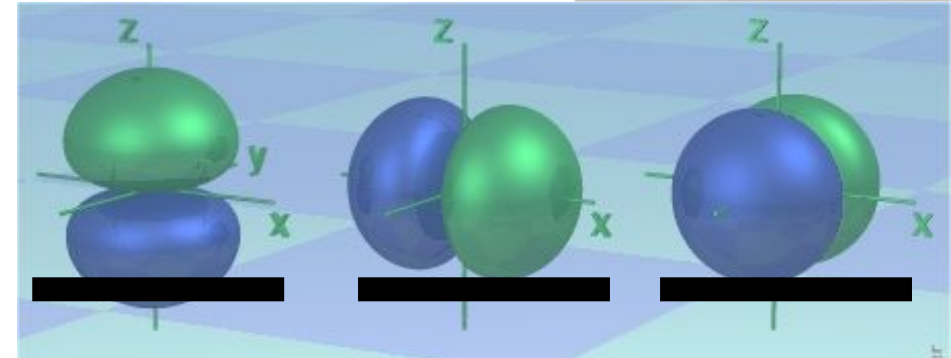
- Orbitals

- s / 1 position / 2 e⁻

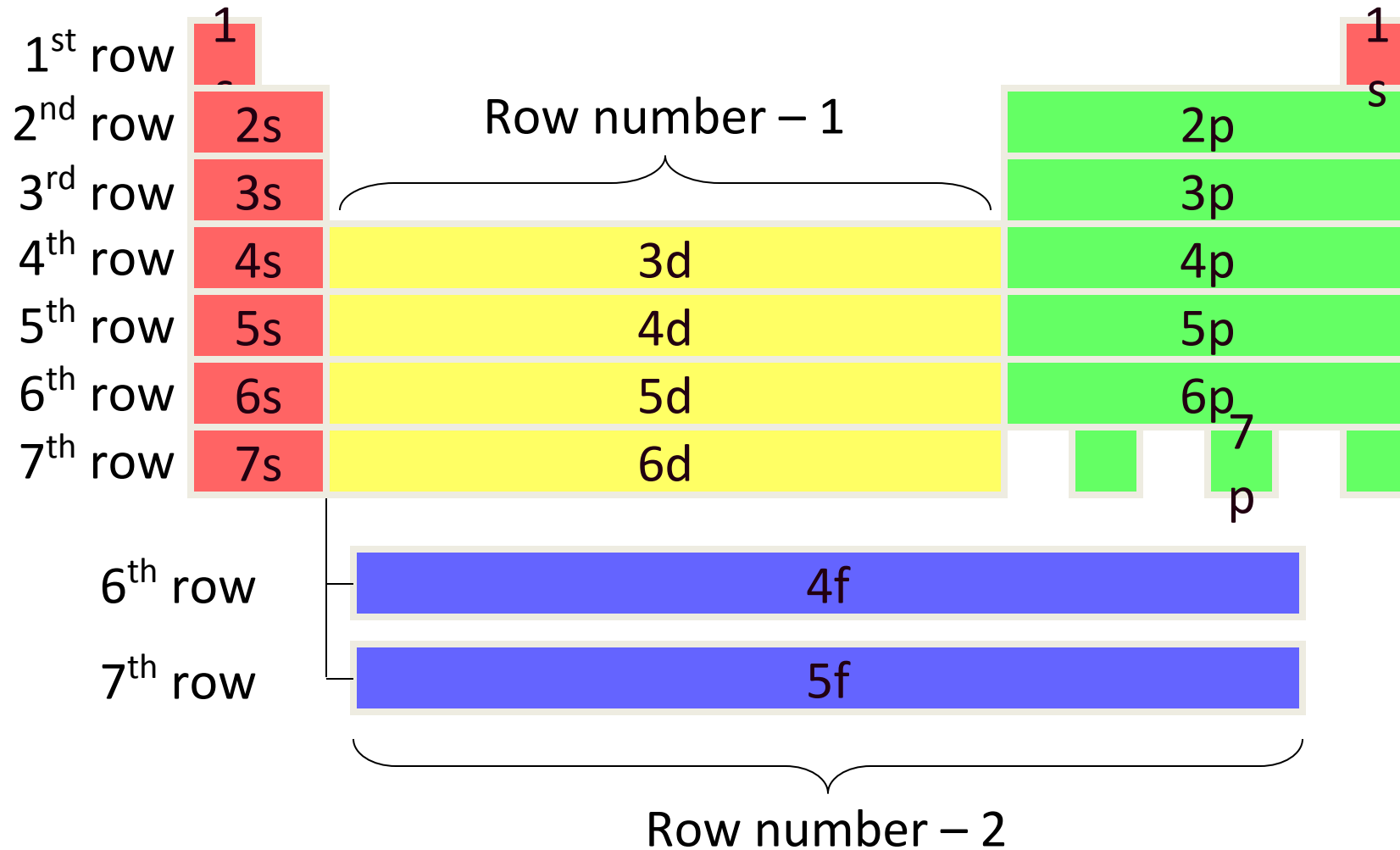
- p / 3 positions / 6 e⁻

- d / 5 positions / 10 e⁻

- f / 7 positions / 14 e⁻



Electron Configurations



Orbital Notations

- Combines electron configuration with the spin quantum number.
- Use the configurations to help you write the correct orbital notation.
- Don't forget the rules:
 - Aufbau
 - Hund
 - Pauli exclusion

Noble Gas Configuration

- Find your element.
- Find the noble gas (Group 8A) before your element.
- Write the noble gas in brackets.
- Add electrons to the noble gas until you reach your element.