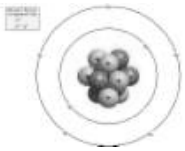
Electron Configurations

Bohr

- Bohr proposed that the _____ atom has only certain allowable energy states.
- He suggested that the single _____ in a hydrogen atom moves around the nucleus in only certain allowed circular orbits.



De Broglie

- DeBroglie stated that electrons had _____ like characteristics
- Came up with the equation:

$$\lambda = \frac{h}{mv}$$

The Heisenberg Uncertainty Principle

- The **Heisenberg uncertainty principle** states that it is fundamentally impossible to know precisely both the _____ and _____ of a particle at the same time.

The Schrödinger wave equation

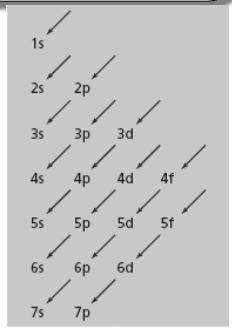
- Combined the ideas of Bohr & DeBroglie
- The atomic model in which electrons are treated as waves and particles is called the wave mechanical model of the atom or, more commonly, the _____model of the atom.

Electron Configuration

- **Electron configuration** – the arrangement of _____ in an atom

Aufbau Principle

- Each electron must occupy the _____ energy level first



Pauli Exclusion Principle

- In order for 2 electrons to share an orbital, they must have _____
- In chemistry we designate spins with _____ .
- When 2 electrons enter an orbital, they must enter ___

Hund's Rule

- A single electron with the same spin must occupy each equal energy orbital before additional electrons will _____ up with opposite spins
- You must fill before you pair

Arrow Diagrams

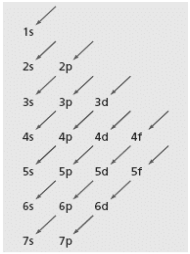
- Before we begin writing arrow diagrams there are a few things you need to know
- s – can hold a max of ___ electrons
- p – can hold a max of ___ electrons
- d – can hold a max of ___ electrons
- f – can hold a max of ___ electrons

Arrow Diagrams

- s – has 1 orbital
- p – has 3 orbitals
- d – has 5 orbitals
- f – has 7 orbitals

Arrow Diagrams

- Lastly, you need to know the sequence of orbitals. I will NOT give you this on a test!



Arrow Diagrams

- Write the arrow diagram for sodium

Arrow Diagrams

- Draw the arrow diagram for Br

Electron Configurations

- Writing electron configurations is just a shorter way to write an arrow diagram
- You start with 1s and continue the configuration until you get the correct number of electrons

Electron Configurations

- Write the full electron configuration for K

Electron Configurations

- Write the full electron configuration for Kr

- Write the full electron configuration for P

Noble Gas Configurations

- Noble Gas configuration is just a short hand way to write an electron configuration
- Steps
  1. Find the element
  2. Find the _____before that element (Group 8A) and place it in [brackets]
  3. Move one spot
  4. Start the configuration from there and keep going until you get to your element

Reading the periodic table

- **s block** – the first 2 columns of the periodic table (starts with 1s)
- **p block** – Groups 3A-8A, six columns (starts with 2p)
- **d block** – the center portion of the periodic table consisting of 10 columns (starts with 3d)
- **f block** – the two bottom rows of the periodic table consisting of 14 columns (starts with 4 f)

Noble Gas Configurations

- Write the noble gas configuration for Na

Noble Gas Configurations

- Write the noble gas configuration for Br

- Write the noble gas configuration for Mn

Final Entry Configuration

- Final entry configuration – the _____ in an electron configuration

- It's like a road map to the element

- Can Identify the element

Final Entry Configuration

- What is the final entry configuration for Si?

Final Entry Configuration

- What is the final entry configuration for Ag?

- What is the final entry configuration for Cl?

- What is the final entry configuration for Na?

Final Entry Configuration

- What element has the final entry configuration of $4p^3$?

- What element has the final entry configuration of $4d^1$?