What is Electron Configuration?

Worksheet

Electron configuration is the distribution of electrons across orbitals and subshells in an atom. It follows the order 1s, 2s, 2p, 3s, 3p, 4s, 3d, 4p... up to the total atomic number.

Questions

1. What is the electron configuration of oxygen (O, Z=8)?

A) 1s 2s 2p
B) 1s 2s 2p
C) 1s 2s 2p
D) 1s 2s 2p

2. How many electrons can fit in a p subshell?

A) 2
B) 4
C) 6
D) 10

3. Which subshell fills after 3p?

A) 3d
B) 4s
C) 4p
D) 4f

4. Write the electron configuration of argon (Ar, Z=18).

A) 1s 2s 2p 3s 3p
B) 1s 2s 2p 3s 3p
C) 1s 2s 2p 3s 3d
D) [Ne] 3s 3p

5. Write the electron configuration for nitrogen (N, Z=7).

6. What does the exponent in 2p mean?

7. Draw the orbital diagram for beryllium (Be, Z=4).

8. Define: What is the Aufbau principle?

9. Define: In what order do electrons fill orbitals?

10. Define: What does an orbital diagram show?

Answer Key

1. B) 1s 2s 2p - Oxygen has 8 electrons: fill 1s (2) + 2s (2) + 2p (4) = 8 total.

2. C) 6 - A p subshell has 3 orbitals, each holding max 2 electrons = 6 total.

3. B) 4s - The Aufbau order: 3p fills first, then 4s, then 3d (d fills after the next s).

4. A) 1s 2s 2p 3s 3p - Ar has 18 electrons: 1s 2s 2p (Ne core, 10) + 3s 3p (8 more) = 18.

5. Follow the Aufbau order: 1s 2s 2p Nitrogen has 7 electrons total Configuration: 1s 2s 2p

6. The exponent tells how many electrons occupy that subshell 2p means 5 electrons in the 2p subshell Example: Chlorine (Cl) ends in 2p

7. Be configuration: 1s 2s 1s: [] 2s: [] Both 1s and 2s subshells are full

8. The building-up rule: electrons fill orbitals of lowest energy first, higher-energy orbitals only when lower ones are full.

9. 1s 2s 2p 3s 3p 4s 3d 4p...

10. A box-and-arrow diagram showing which orbitals are occupied and the spin of each electron (or).