



Electron Configuration & Orbital Diagram



1. Given $3p^5$

a. What does 3 represent? _____

b. What does "p" represent? _____

c. What does the 5 represent? _____

2. How are 2s and 2p orbitals the same? How do they differ?

3. What is the lowest energy that a d orbital can have? _____

4. What is the maximum number of electrons that can be in a f subshell? _____

5. How many d orbitals of the same energy are possible? _____

6. Name the elements that have the following electron configurations.

i. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^5$ _____

ii. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^4$ _____

iii. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^4$ _____

iv. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^2$ _____

7. Draw the orbital filling diagram of the following elements.

Element

Orbital Filling Diagram

O

Mg

Ar

Ni (shorthand)

Br (shorthand)



Electron Configuration & Orbital Diagram



Answers

1. Given $3p^5$

- a. What does 3 represent? Energy level
- b. What does "p" represent? The shape of the orbital
- c. What does the 5 represent? Number of electrons

2. How are 2s and 2p orbitals the same? How do they differ?

They have the same energy level. They differ in shape.

3. What is the lowest energy that a d orbital can have? 3

4. What is the maximum number of electrons that can be in a f subshell? 14

5. How many d orbitals of the same energy are possible? 5

6. Name the elements that have the following electron configurations.

i. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^5$ Manganese

ii. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^4$ Selenium

iii. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^4$ Molybdenum

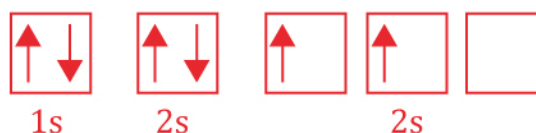
iv. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^2$ Tin

7. Draw the orbital filling diagram of the following elements.

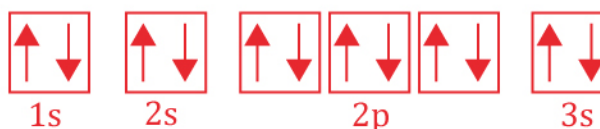
Element

Orbital Filling Diagram

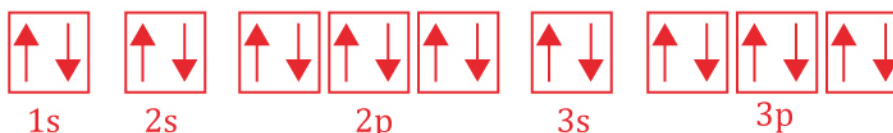
O



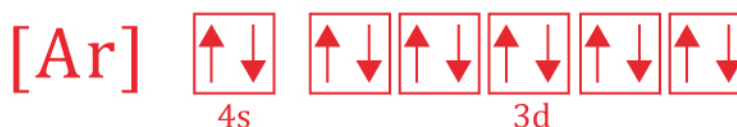
Mg



Ar



Ni (shorthand)



Br (shorthand)

