

## B. Electron Configurations

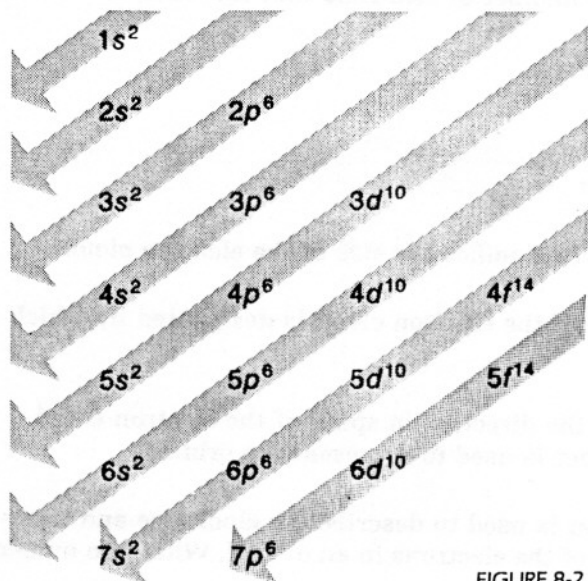


FIGURE 8-2

Use the diagonal rule to write the electron configurations for the following elements.

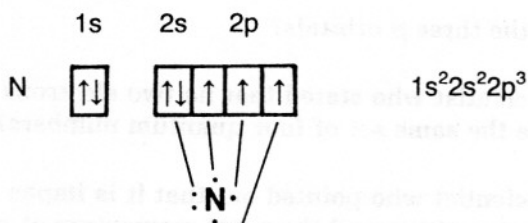
1. lithium \_\_\_\_\_
2. nitrogen \_\_\_\_\_
3. zinc \_\_\_\_\_
4. bromine \_\_\_\_\_
5. barium \_\_\_\_\_

## C. Electron Dot Diagram

### EXAMPLE: Electron Dot Diagram

Write the electron dot diagram for nitrogen.

*Solving process:*



Use the orbital filling diagrams of Section 8:11 in the textbook to help you write the electron dot diagrams for the following elements.

1. oxygen
2. argon
3. potassium
4. scandium

1. What is the maximum number of electrons that can be in the
  - a. second energy level?  
\_\_\_\_\_
  - b. third energy level?  
\_\_\_\_\_
  - c. fourth energy level?  
\_\_\_\_\_
2. Which quantum number signifies the size of the electron cloud?  
\_\_\_\_\_
3. The sublevel or shape of the electron cloud is designated by which quantum number?  
\_\_\_\_\_
4. The orbital describes the direction in space of the electron cloud. Which quantum number is used to represent the orbital?  
\_\_\_\_\_
5. The  $s$  quantum number is used to describe the clockwise and counterclockwise rotation of the electrons in an orbital. What two numerical values can  $s$  have?  
\_\_\_\_\_
6. When  $n$  has the numerical value 4, what values can  $\ell$  have?  
\_\_\_\_\_
7. When  $\ell = 3$ , what values can  $m$  have?  
\_\_\_\_\_
8. How many orbitals are contained in the  $p$  sublevel?  
\_\_\_\_\_
9. How many orbitals are contained in the  $d$  sublevel?  
\_\_\_\_\_
10. How many electrons can be in one orbital?  
\_\_\_\_\_
11. What is the maximum number of electrons that can be in the  $p$  sublevel?  
\_\_\_\_\_
12. What is the maximum number of electrons that can be in the  $f$  sublevel?  
\_\_\_\_\_
13. What is the maximum number of electrons that can be in a  $d$  sublevel?  
\_\_\_\_\_
14. What names are used for the three  $p$  orbitals?  
\_\_\_\_\_
15. What is the name of the scientist who stated that no two electrons in the same atom can have the same set of four quantum numbers?  
\_\_\_\_\_
16. What is the name of the scientist who pointed out that it is impossible to know both the exact position and the exact momentum of an electron at the same time?  
\_\_\_\_\_
17. What is the name of the scientist who treated the electron mathematically as a wave?  
\_\_\_\_\_
18. Mechanics is a word used to describe a system of mathematical equations. Which system of mathematical equations is used to describe the behavior of extremely small particles traveling at velocities near the speed of light?  
\_\_\_\_\_