

# Electron Configuration Worksheet

1. How many electron shells contain s-orbitals? \_\_\_\_\_
2. Which electron shells contain d-orbitals? \_\_\_\_\_
3. Name the types of orbitals present in the second electron shell. \_\_\_\_\_
4. How many p-orbitals can be filled in a shell? \_\_\_\_\_
5. How many d-orbitals can be filled in a shell? \_\_\_\_\_
6. Determine the electron configuration of the following elements.

Element	Atomic Number	Electron Configuration
Cobalt (Co)	27	
Germanium (Ge)	32	
Yttrium (Y)	39	
Neodymium (Nd)	60	
Gold (Au)	79	

7. Name each of the following elemental species. Then, write the full electron configuration of the ground state

- a. Li \_\_\_\_\_
- b. Ca \_\_\_\_\_
- c. I \_\_\_\_\_
- d. Fe \_\_\_\_\_
- e. Na<sup>+</sup> \_\_\_\_\_

8. Name each of the following elemental species. Then, write the shorthand (abbreviated) electron configuration of the ground state.

- a. Ar \_\_\_\_\_
- b. K \_\_\_\_\_
- c. Sr \_\_\_\_\_
- d. C \_\_\_\_\_
- e. I<sup>-</sup> \_\_\_\_\_

# Electron Configuration Worksheet

## Answers

1. How many electron shells contain s-orbitals? All four electron shells
2. Which electron shells contain d-orbitals? Electron shells 3 and 4
3. Name the types of orbitals present in the second electron shell. s and p orbitals
4. How many p-orbitals can be filled in a shell? 3
5. How many d-orbitals can be filled in a shell? 5
6. Determine the electron configuration of the following elements.

Element	Atomic Number	Electron Configuration
Cobalt (Co)	27	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^7$
Germanium (Ge)	32	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^2$
Yttrium (Y)	39	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^1$
Neodymium (Nd)	60	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^4$
Gold (Au)	79	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^1 4f^{14} 5d^{10}$

7. Name each of the following elemental species. Then, write the full electron configuration of the ground state

- a. Li Lithium  $1s^2 2s^1$
- b. Ca Calcium  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$
- c. I Iodine  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^5$
- d. Fe Iron  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$
- e. Na<sup>+</sup> Sodium ion  $1s^2 2s^2 2p^6$

8. Name each of the following elemental species. Then, write the shorthand (abbreviated) electron configuration of the ground state.

- a. Ar Argon  $[\text{He}] 2s^2 2p^6$
- b. K Potassium  $[\text{Ar}] 4s^1$
- c. Sr Strontium  $[\text{Kr}] 5s^2$
- d. C Carbon  $[\text{He}] 2s^2 2p^2$
- e. I<sup>-</sup> Iodine ion  $[\text{Kr}] 5s^2 4d^{10} 5p^6$