

Electronic Configuration

1. Use noble gases to write the abbreviated electron configurations of the following?

- | | | | |
|-----------------------|-------|------------------------|-------|
| i. Li | _____ | ii. B | _____ |
| iii. O | _____ | iv. Mg | _____ |
| v. Cl | _____ | vi. V | _____ |
| vii. Se^{2-} | _____ | viii. Cr^{2+} | _____ |
| ix. I | _____ | x. Ag | _____ |

2. Identify the element with the following electron configuration

- | | |
|--|-------|
| i. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^4$ | _____ |
| ii. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2$ | _____ |
| iii. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^1 4d^7$ | _____ |
| iv. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^{14} 5d^{10}$ | _____ |
| v. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^{14} 5d^{10} 6p^6 7s^1$ | _____ |

3. Determine if the following electron configurations are correct:

- | | |
|--|-------|
| i. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4d^{10} 4p^6 5s^1$ | _____ |
| ii. $1s^2 2s^2 2p^6 3s^3$ | _____ |
| iii. $[\text{Rn}] 7s^2 5f^9 6d^2$ | _____ |
| iv. $[\text{Ar}] 5s^2 4d^{10} 5p^5$ | _____ |
| v. $[\text{Xe}] 6s^2 4f^{10}$ | _____ |

4. Identify the following elements

- | | |
|--------------------------------------|-------|
| i. $1s^2 2s^2 2p^2$ | _____ |
| ii. $1s^2 2s^2 2p^6$ | _____ |
| iii. $[\text{Ar}] 4s^2 3d^{10} 4p^5$ | _____ |
| iv. $[\text{Kr}] 5s^2 4d^1$ | _____ |
| v. $[\text{Ne}] 3s^2 3p^3$ | _____ |

Electronic Configuration

Answers

1. Use noble gases to write the abbreviated electron configurations of the following?

- | | | | |
|-----------------------|---|------------------------|--|
| i. Li | <u>[He] 2s¹</u> | ii. B | <u>[He] 2s² 2p¹</u> |
| iii. O | <u>[He] 2s² 2p⁴</u> | iv. Mg | <u>[Ne] 3s²</u> |
| v. Cl | <u>[Ne] 3s² 3p⁵</u> | vi. V | <u>[Ar] 4s² 3d³</u> |
| vii. Se ²⁻ | <u>[Ar] 4s² 3d¹⁰ 4p⁶</u> | viii. Cr ²⁺ | <u>[Ar] 3d⁴</u> |
| ix. I | <u>[Kr] 5s² 4d¹⁰ 5p⁶</u> | x. Ag | <u>[Kr] 5s¹ 4d¹⁰</u> |

2. Identify the element with the following electron configuration

- | | |
|--|------------------|
| i. 1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 4s ² 3d ¹⁰ 4p ⁴ | <u>Selenium</u> |
| ii. 1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 4s ² 3d ¹⁰ 4p ⁶ 5s ² | <u>Strontium</u> |
| iii. 1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 4s ² 3d ¹⁰ 4p ⁶ 5s ¹ 4d ⁷ | <u>Ruthenium</u> |
| iv. 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 ¹⁴ 5d ¹⁰ | <u>Mercury</u> |
| v. 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 ¹⁴ 5d ¹⁰ 6p ⁶ 7s ¹ | <u>Francium</u> |

3. Determine if the following electron configurations are correct:

- | | |
|---|---|
| i. 1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 4s ² 4d ¹⁰ 4p ⁶ 5s ¹ | <u>No. It should be 3d¹⁰ and not 4d¹⁰</u> |
| ii. 1s ² 2s ² 2p ⁶ 3s ³ | <u>No. There can only be 2 electrons in an s-orbital</u> |
| iii. [Rn] 7s ² 5f ⁹ 6d ² | <u>No. 5f shell must be filled before the 6d shell</u> |
| iv. [Ar] 5s ² 4d ¹⁰ 5p ⁵ | <u>No. The noble gas should be [Kr], not [Ar]</u> |
| v. [Xe] 6s ² 4f ¹⁰ | <u>Yes.</u> |

4. Identify the following elements

- | | |
|--|-----------|
| i. 1s ² 2s ² 2p ² | <u>C</u> |
| ii. 1s ² 2s ² 2p ⁶ | <u>Ne</u> |
| iii. [Ar] 4s ² 3d ¹⁰ 4p ⁵ | <u>Br</u> |
| iv. [Kr] 5s ² 4d ¹ | <u>Y</u> |
| v. [Ne] 3s ² 3p ³ | <u>P</u> |