

Name : Date :

Electronic Configuration

1. Identify the elements described below.

- i. Which element contains a full second energy level? _____
- ii. Which element contains three unpaired electrons in its third energy level? _____
- iii. Which element contains five electrons in its 3d energy level? _____
- iv. Which element contains two unpaired electrons in its fifth energy level? _____
- v. Which element contains only two electrons in 5s? _____

2. In the space below, write the **unabbreviated** electron configuration of the following elements.

- i. Sodium _____
- ii. Iron _____
- iii. Bromine _____
- iv. Barium _____
- v. Radium _____

3. In the space below, write the **abbreviated** electron configuration of the following elements.

- i. Cobalt _____
- ii. Silver _____
- iii. Tellurium _____
- iv. Radium _____
- v. Lawrencium _____

4. Which element has the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^2$? _____

5. What is the electronic configuration of aluminum, Al? _____

6. What is the noble gas configuration for the Pb atom? _____

7. Explain why the following electron configuration is invalid: $1s^2 2s^2 2p^6 3s^3 3d^5$?

Electronic Configuration

Answers

1. Identify the elements described below.

- i. Which element contains a full second energy level? Ne
- ii. Which element contains three unpaired electrons in its third energy level? N
- iii. Which element contains five electrons in its 3d energy level? Mn
- iv. Which element contains two unpaired electrons in its fifth energy level? Si
- v. Which element contains only two electrons in 5s? Sr

2. In the space below, write the **unabbreviated** electron configuration of the following elements.

- i. Sodium $1s^2 2s^2 2p^6 3s^1$
- ii. Iron $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$
- iii. Bromine $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^5$
- iv. Barium $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2$
- v. Radium $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^{14} 5d^{10} 6p^6 7s^2$

3. In the space below, write the **abbreviated** electron configuration of the following elements.

- i. Cobalt $[Ar] 3d^7 4s^2$
- ii. Silver $[Kr] 4d^{10} 5s^1$
- iii. Tellurium $[Kr] 4d^{10} 5s^2 5p^4$
- iv. Radium $[Rn] 7s^2$
- v. Lawrencium $[Rn] 5f^{14} 7s^2 7p^1$

4. Which element has the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^2$? Titanium

5. What is the electronic configuration of aluminum, Al? $1s^2 2s^2 2p^6 3s^2 3p^1$

6. What is the noble gas configuration for the Pb atom? $[Xe] 6s^2 4f^{14} 5d^{10} 6p^2$

7. Explain why the following electron configuration is invalid: $1s^2 2s^2 2p^6 3s^3 3d^5$

3p comes after 3s and the 3s can only contain 2 electrons.