

Electron Configuration Quiz Answer Key PDF

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Which of the following are characteristics of the f-block elements?

- A. They include the lanthanides and actinides. ✓**
- B. They are typically found in the s-block of the periodic table.
- C. They often have partially filled f orbitals. ✓**
- D. They have high melting points. ✓**

What is the maximum number of electrons that can occupy a single s orbital?

- A. 1
- B. 2 ✓**
- C. 3
- D. 4

Which of the following elements have a full p subshell in their ground state electron configuration?

- A. Neon (Ne) ✓**
- B. Argon (Ar) ✓**
- C. Helium (He)
- D. Krypton (Kr) ✓**

Which of the following quantum numbers are used to describe the electron configuration of an atom?

- A. Principal quantum number (n) ✓**
- B. Azimuthal quantum number (l) ✓**
- C. Magnetic quantum number (m_l) ✓**
- D. Spin quantum number (m_s) ✓**

Explain how the periodic table is organized based on electron configurations and how this affects the chemical properties of elements.

The periodic table is organized based on the electron configurations of elements, with elements in the same group having similar valence electron arrangements. This affects their chemical properties, as elements with similar electron configurations tend to exhibit similar reactivity and bonding behavior.

Which of the following statements about electron configuration are true?

- A. Electrons fill orbitals starting from the highest energy level.
- B. No two electrons in an atom can have the same set of four quantum numbers. ✓**
- C. Electrons will pair up in an orbital before filling all degenerate orbitals.
- D. The electron configuration of an ion differs from its neutral atom. ✓**

In which block of the periodic table is the element with the electron configuration $[\text{Kr}] 5s^2 4d^{10} 5p^5$ located?

- A. s-block
- B. p-block ✓**
- C. d-block
- D. f-block

Explain how Hund's Rule affects the electron configuration of carbon.

In carbon, which has an atomic number of 6, the electron configuration is $1s^2 2s^2 2p_x^1 2p_y^1$. According to Hund's Rule, the two electrons in the 2s orbital are paired, while the four valence electrons occupy the 2p_x and 2p_y orbitals singly before any pairing occurs.

What is the electron configuration of a helium atom?

- A. $1s^1$
- B. $1s^2$ ✓**
- C. $1s^2 2s^1$
- D. $1s^2 2s^2$

Which principle states that no two electrons in an atom can have the same set of four quantum numbers?

- A. Hund's Rule
- B. Pauli Exclusion Principle ✓**
- C. Aufbau Principle
- D. Heisenberg Uncertainty Principle

Which element has the electron configuration [Ne] 3s² 3 p¹?

- A. Magnesium (Mg)
- B. Aluminum (Al) ✓**
- C. Silicon (Si)
- D. Phosphorus (P)

Which of the following elements has a partially filled f subshell?

- A. Calcium (Ca)
- B. Cerium (Ce) ✓**
- C. Chromium (Cr)
- D. Cobalt (Co)

Which elements have electron configurations that are exceptions to the expected order?

- A. Copper (Cu) ✓**
- B. Chromium (Cr) ✓**
- C. Calcium (Ca)
- D. Neon (Ne)

Which of the following are true about the d-block elements?

- A. They are also known as transition metals. ✓**
- B. They typically have partially filled d orbitals. ✓**
- C. They are located in the f-block of the periodic table.
- D. They often exhibit multiple oxidation states. ✓**

Discuss the role of electron configuration in determining the magnetic properties of an element.

The magnetic properties of an element are primarily determined by its electron configuration; elements with unpaired electrons exhibit paramagnetism, while those with all electrons paired are typically diamagnetic.

Which element has a full d subshell in its ground state electron configuration?

- A. Iron (Fe)
- B. Copper (Cu)
- C. Zinc (Zn) ✓**
- D. Nickel (Ni)

Why do elements like chromium and copper have electron configurations that differ from the expected pattern?

Chromium has an electron configuration of $[\text{Ar}] 3d^5 4s^1$ instead of $[\text{Ar}] 3d^4 4s^2$, and copper has $[\text{Ar}] 3d^{10} 4s^1$ instead of $[\text{Ar}] 3d^9 4s^2$, to achieve greater stability.

Describe the significance of the Pauli Exclusion Principle in determining electron configurations.

The Pauli Exclusion Principle is significant in determining electron configurations because it ensures that each electron in an atom occupies a unique quantum state, preventing any two electrons from having identical quantum numbers.

How does the electron configuration of an atom influence its chemical reactivity? Provide an example.

The electron configuration influences an atom's reactivity by determining its tendency to gain, lose, or share electrons; for instance, sodium (Na) is highly reactive due to its single valence electron.

What is the electron configuration of a chlorine ion (Cl⁻)?

- A. $1s^2 2s^2 2p^6 3s^2 3p^5$
- B. $1s^2 2s^2 2p^6 3s^2 3p^6$ ✓**
- C. $1s^2 2s^2 2p^6 3s^2 3p^4$
- D. $1s^2 2s^2 2p^6 3s^2 3p^3$