

Electron Configuration Practice Worksheet Answer Key PDF

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Part 1: Building a Foundation

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

undefined. 1

undefined. 2 ✓

undefined. 3

undefined. 6

A single p orbital can hold a maximum of 2 electrons.

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undefined. 3

undefined. 6

A single p orbital can hold a maximum of 2 electrons.

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

undefined. 1

undefined. 2 ✓

undefined. 3

undefined. 6

The maximum number of electrons that can occupy a single p orbital is 2.

Which of the following principles are used to determine electron configuration? (Select all that apply)

undefined. **Aufbau Principle** ✓

undefined. **Pauli Exclusion Principle** ✓

undefined. **Hund's Rule** ✓

undefined. Heisenberg Uncertainty Principle

The Aufbau Principle, Pauli Exclusion Principle, and Hund's Rule are all used to determine electron configuration.

Which of the following principles are used to determine electron configuration? (Select all that apply)

undefined. **Aufbau Principle** ✓

undefined. **Pauli Exclusion Principle** ✓

undefined. **Hund's Rule** ✓

undefined. Heisenberg Uncertainty Principle

The principles include the Aufbau Principle, Pauli Exclusion Principle, and Hund's Rule.

Which of the following principles are used to determine electron configuration? (Select all that apply)

undefined. **Aufbau Principle** ✓

undefined. **Pauli Exclusion Principle** ✓

undefined. **Hund's Rule** ✓

undefined. Heisenberg Uncertainty Principle

The principles used to determine electron configuration include the Aufbau Principle, Pauli Exclusion Principle, and Hund's Rule.

Describe the Pauli Exclusion Principle and its significance in electron configuration.

The Pauli Exclusion Principle states that no two electrons can have the same set of quantum numbers, which is significant as it explains the arrangement of electrons in orbitals.

Describe the Pauli Exclusion Principle and its significance in electron configuration.

The Pauli Exclusion Principle states that no two electrons can have the same set of quantum numbers, which is crucial for determining electron configuration.

Describe the Pauli Exclusion Principle and its significance in electron configuration.

The Pauli Exclusion Principle states that no two electrons can have the same set of quantum numbers, which is significant for determining the arrangement of electrons in orbitals.

List the four types of orbitals and their maximum electron capacities.

1. s orbital

2

2. p orbital

6

3. d orbital

10

4. f orbital

14

The four types of orbitals are s (2), p (6), d (10), and f (14).

Which of the following is the correct electron configuration for the element Neon (Ne)?

undefined. $1s^2 2s^2 2p^6$ ✓

undefined. $1s^2 2s^2 2p^4$

undefined. $1s^2 2s^2 2p^2$

undefined. $1s^2 2s^2 3s^2$

The correct electron configuration for Neon is $1s^2 2s^2 2p^6$.

Which of the following is the correct electron configuration for the element Neon (Ne)?

undefined. $1s^2 2s^2 2p^6$ ✓

undefined. $1s^2 2s^2 2p^4$

undefined. $1s^2 2s^2 2p^2$

undefined. $1s^2 2s^2 3s^2$

The correct electron configuration for Neon is $1s^2 2s^2 2p^6$.

Which of the following is the correct electron configuration for the element Neon (Ne)?

undefined. $1s^2 2s^2 2 p^6$ ✓

undefined. $1s^2 2s^2 2 p^4$

undefined. $1s^2 2s^2 2 p^2$

undefined. $1s^2 2s^2 3s^2$

The correct electron configuration for Neon is $1s^2 2s^2 2 p^6$.

Part 2: Application and Analysis

How does the position of an element in the periodic table relate to its electron configuration?

undefined. It determines the number of protons.

undefined. It indicates the number of neutrons.

undefined. **It shows the order of electron filling.** ✓

undefined. It specifies the atomic mass.

The position of an element in the periodic table indicates the order of electron filling and the number of electrons in its outer shell.

How does the position of an element in the periodic table relate to its electron configuration?

undefined. It determines the number of protons.

undefined. It indicates the number of neutrons.

undefined. **It shows the order of electron filling.** ✓

undefined. It specifies the atomic mass.

The position indicates the order of electron filling and the number of valence electrons.

How does the position of an element in the periodic table relate to its electron configuration?

undefined. It determines the number of protons.

undefined. It indicates the number of neutrons.

undefined. **It shows the order of electron filling.** ✓

undefined. It specifies the atomic mass.

The position of an element in the periodic table indicates the order of electron filling and the number of valence electrons.

Which of the following elements have electron configurations that end in 3 d? (Select all that apply)

Scandium ✓

Iron ✓

Zinc ✓

Calcium

Scandium, Iron, and Zinc have electron configurations that end in 3 d.

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Scandium ✓

Iron ✓

Zinc ✓

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Scandium, Iron, and Zinc have electron configurations that end in 3 d.

Which of the following elements have electron configurations that end in 3 d? (Select all that apply)

Scandium ✓

Iron ✓

Zinc ✓

Calcium

The elements with electron configurations that end in 3 d include Scandium, Iron, and Zinc.

Explain Hund's Rule and provide an example of how it applies to filling the p orbitals.

Hund's Rule states that electrons will fill degenerate orbitals singly before pairing up. For example, in the p orbitals, each of the three p orbitals will receive one electron before any pairing occurs.

Explain Hund's Rule and provide an example of how it applies to filling the p orbitals.

Hund's Rule states that electrons will fill degenerate orbitals singly before pairing up. For example, in the p orbitals, one electron will occupy each orbital before any pairing occurs.

Explain Hund's Rule and provide an example of how it applies to filling the p orbitals.

Hund's Rule states that electrons will fill degenerate orbitals singly before pairing up, which ensures maximum stability. An example is the filling of the 2 p orbitals in oxygen.

Write the electron configuration for the following ions:

1. Na⁺

1s² 2s² 2 p⁶

2. Cl⁻

1s² 2s² 2 p⁶

The electron configurations for the ions are Na⁺: 1s² 2s² 2 p⁶ and Cl⁻: 1s² 2s² 2 p⁶.

Which of the following elements has the electron configuration [Ar] 4s¹ 3 d⁵?

undefined. Chromium ✓

undefined. manganese

undefined. Iron

undefined. Copper

The element with the electron configuration [Ar] 4s¹ 3 d⁵ is Chromium.

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undefined. Copper

The element with the electron configuration [Ar] 4s¹ 3 d⁵ is Chromium.

Which of the following elements has the electron configuration [Ar] 4s¹ 3 d⁵?

undefined. Chromium ✓

undefined. manganese

undefined. Iron

undefined. Copper

The element with the electron configuration $[\text{Ar}] 4s^1 3d^5$ is Chromium.

Describe how the electron configuration of an atom changes when it forms a cation.

When an atom forms a cation, it loses one or more electrons, typically from the outermost shell, resulting in a new electron configuration that reflects the reduced number of electrons.

Describe how the electron configuration of an atom changes when it forms a cation.

When an atom forms a cation, it loses electrons, typically from the outermost shell, which alters its electron configuration.

Describe how the electron configuration of an atom changes when it forms a cation.

When an atom forms a cation, it loses one or more electrons, typically from the outermost shell, resulting in a positive charge.

Part 3: Evaluation and Creation

Which of the following are exceptions to the typical electron configuration rules? (Select all that apply)

undefined. Copper ✓

undefined. Chromium ✓

undefined. Potassium

undefined. Zinc

Copper and Chromium are exceptions to the typical electron configuration rules.

Which of the following are exceptions to the typical electron configuration rules? (Select all that apply)

undefined. Copper ✓

undefined. Chromium ✓

undefined. Potassium

undefined. Zinc

Copper and Chromium are exceptions to the typical electron configuration rules.

Which of the following are exceptions to the typical electron configuration rules? (Select all that apply)

undefined. **Copper** ✓

undefined. **Chromium** ✓

undefined. Potassium

undefined. Zinc

The exceptions to the typical electron configuration rules include Copper and Chromium.

Analyze why certain elements like copper and chromium have electron configurations that differ from the expected pattern.

Copper and Chromium have electron configurations that differ from the expected pattern due to the stability associated with half-filled and fully filled d orbitals, which can lower the overall energy of the atom.

Analyze why certain elements like copper and chromium have electron configurations that differ from the expected pattern.

Copper and Chromium have configurations that differ due to the stability associated with half-filled and fully filled d subshells.

Analyze why certain elements like copper and chromium have electron configurations that differ from the expected pattern.

Certain elements like copper and chromium have electron configurations that differ from the expected pattern due to the stability associated with half-filled and fully filled d orbitals.

In which of the following situations would an electron configuration be used to predict chemical behavior?

undefined. Determining atomic mass

undefined. **PredictING reactivity** ✓

undefined. Calculating density

undefined. Measuring temperature

Electron configuration is used to predict chemical behavior, particularly in predicting reactivity.

In which of the following situations would an electron configuration be used to predict chemical behavior?

undefined. Determining atomic mass

undefined. Predict ing reactivity ✓

undefined. Calculating density

undefined. Measuring temperature

Electron configuration is used to predict reactivity, particularly based on the arrangement of valence electrons.

In which of the following situations would an electron configuration be used to predict chemical behavior?

undefined. Determining atomic mass

undefined. Predicti ng reactivity ✓

undefined. Calculating density

undefined. Measuring temperature

Electron configuration can be used to predict chemical behavior, particularly in predicting reactivity based on valence electrons.

Evaluate the importance of electron configuration in determining the magnetic properties of an element. Provide examples to support your answer.

Electron configuration is crucial in determining the magnetic properties of an element, as unpaired electrons in orbitals contribute to magnetism. For example, elements like Iron have unpaired electrons that make them magnetic.

Evaluate the importance of electron configuration in determining the magnetic properties of an element. Provide examples to support your answer.

Electron configuration is crucial for determining magnetic properties, as unpaired electrons contribute to magnetism.

Evaluate the importance of electron configuration in determining the magnetic properties of an element. Provide examples to support your answer.

Electron configuration is important in determining the magnetic properties of an element, as unpaired electrons contribute to magnetism. For example, elements like iron exhibit ferromagnetism due to unpaired electrons.

Which of the following scenarios would most likely require a creative approach to solve using electron configuration?

undefined. Identifying the number of protons in an atom

undefined. DesignING a new material with specific magnetic properties ✓

undefined. Calculating the atomic mass of an element

undefined. Measuring the volume of a gas

DesignING a new material with specific magnetic properties would require a creative approach using electron configuration.

Which of the following scenarios would most likely require a creative approach to solve using electron configuration?

undefined. Identifying the number of protons in an atom

undefined. Design ing a new material with specific magnetic properties ✓

undefined. Calculating the atomic mass of an element

undefined. Measuring the volume of a gas

Design ing a new material with specific magnetic properties would require a creative approach using electron configuration.

Which of the following scenarios would most likely require a creative approach to solve using electron configuration?

undefined. Identifying the number of protons in an atom

undefined. Design ing a new material with specific magnetic properties ✓

undefined. Calculating the atomic mass of an element

undefined. Measuring the volume of a gas

Design a new material with specific magnetic properties would most likely require a creative approach to solve using electron configuration.