Practice Electron Configuration Worksheet

Practice Electron Configuration Worksheet

Disclaimer: *The practice electron configuration worksheet was generated with the help of StudyBlaze AI. Please be aware that AI can make mistakes. Please consult your teacher if you're unsure about your solution or think there might have been a mistake. Or reach out directly to the StudyBlaze team at max@studyblaze.io.*

Part 1: Building a Foundation

Which principle states that electrons fill the lowest energy orbitals first?

Hint: Think about the order in which electrons occupy orbitals.

- ◯ A) Hund's Rule
- ◯ B) Pauli Exclusion Principle
- ◯ C) Aufbau Principle
- ◯ D) Heisenberg Uncertainty Principle

Which of the following are types of atomic orbitals? (Select all that apply)

Hint: Consider the different shapes and types of orbitals.

- ☐ A) s
- ☐ B) p
- ☐ C) d
- ☐ D) g

Explain the significance of the Pauli Exclusion Principle in electron configuration.

Hint: Consider how this principle affects electron pairing in orbitals.

List the order of filling for the first four types of orbitals in an atom.

Hint: Think about the sequence in which orbitals are filled according to energy levels.

1. 1s

2. 2s

3. 2 p

4. 3s

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

Hint: Identify the element based on its electron configuration.

- ◯ A) Potassium
- ◯ B) Calcium
- ◯ C) Argon
- ◯ D) Sodium

Part 2: Comprehension and Application

Which of the following statements about Hund's Rule are true? (Select all that apply)

Hint: Consider how electrons occupy orbitals of the same energy.

- ☐ A) Electrons fill degenerate orbitals singly before pairing.
- ☐ B) It applies only to s orbitals.
- ☐ C) It minimizes electron repulsion.
- ☐ D) It is irrelevant for noble gases.

Describe how the periodic table is organized in terms of electron configurations and blocks.

Hint: Think about the arrangement of elements and their electron configurations.

What is the electron configuration for an element in the d-block of the periodic table?

Hint: Consider the ending of the electron configuration for d-block elements.

- ◯ A) Ends in p
- ◯ B) Ends in d
- ◯ C) Ends in s
- ◯ D) Ends in f

Given the electron configuration [Ne] $3s^2$ 3 p^4, which element is this?

Hint: Identify the element based on its electron configuration.

- ☐ A) Sulfur
- ☐ B) Chlorine
- ☐ C) Phosphorus
- ☐ D) Argon

Predict the chemical properties of an element with the electron configuration [Ar] $4s^2$ 3 d^{10} 4 p^5.

Hint: Consider the position of the element in the periodic table and its valence electrons.

Part 3: Analysis, Evaluation, and Creation

Analyze the following electron configurations and identify which are exceptions to the expected order. (Select all that apply)

Hint: Consider the typical order of filling and identify any deviations.

- [ ] A) [Ar] $4s^1$ 3 d^5
- [ ] B) [Kr] $5s^2$ 4 d^{10} 5 p^6
- [ ] C) [Ar] $4s^2$ 3 d^{10} 4 p^6
- [ ] D) [Ar] $4s^1$ 3 d^{10}

Explain why chromium and copper have electron configurations that are exceptions to the Aufbau Principle.

Hint: Consider the stability of half-filled and fully filled subshells.

Which principle can be used to explain the electron configuration of transition metals?

Hint: Consider the principles that govern electron arrangement.

- ◯ A) Hund's Rule
- ◯ B) Pauli Exclusion Principle
- ◯ C) Aufbau Principle
- ◯ D) All of the above

Evaluate the impact of electron configuration on the reactivity of alkali metals.

Hint: Consider how the electron configuration influences the behavior of alkali metals.

Propose an electron configuration for a hypothetical element with an atomic number of 120, and justify your reasoning.

Hint: Consider the expected order of filling and the principles governing electron configurations.

1. [Rn] $5f^{14}$ $6s^2$ 6 p^6

Which of the following elements would likely form a +2 ion based on its electron configuration?

Hint: Consider the electron configurations of the elements listed.

- ◯ A) Magnesium
- ◯ B) Sodium
- ◯ C) Aluminum
- ◯ D) Potassium