Periodic Trend Worksheet Answer Key PDF

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Part 1: Building a Foundation

What is the general trend for atomic radius across a period in the periodic table?

undefined. A) Increases from left to right

undefined. B) Decreases from left to right ✓

undefined. C) Remains constant

undefined. D) Increases and then decreases

The atomic radius generally decreases from left to right across a period.

Which of the following factors affect the atomic radius of an element? (Select all that apply)

undefined. A) Number of protons ✓

undefined. B) Number of electron shells ✓

undefined. C) Electronegativity

undefined. D) Ionization energy

The atomic radius is affected by the number of protons and the number of electron shells.

Define ionization energy and explain why it generally increases across a period.

Ionization energy is the energy required to remove an electron from an atom, and it generally increases across a period due to increased nuclear charge and decreased atomic radius.

List the periodic trends that typically increase from left to right across a period.

1. Electronegativity

Increases from left to right.

2. Ionization energy

Increases from left to right.

3. Electron affinity

Increases from left to right.

Trends that typically increase from left to right include electronegativity, ionization energy, and electron affinity.

Which element is likely to have the highest electronegativity?

undefined. A) Fluorine ✓

undefined. B) Oxygen

undefined. C) Nitrogen

undefined. D) Carbon

Fluorine is likely to have the highest electronegativity due to its position in the periodic table.

Part 2: Application and Analysis

Predict which element would have a larger atomic radius: Sodium (Na) or Potassium (K)? Explain your reasoning.

undefined. A) Sodium

undefined. B) Potassium ✓

undefined. C) Both have the same atomic radius

undefined. D) Cannot be determined

Potassium (K) would have a larger atomic radius than Sodium (Na) because it has more electron shells.

Given the elements Oxygen (O), Sulfur (S), and Selenium (Se), arrange them in order of increasing electronegativity and justify your arrangement.

The order of increasing electronegativity is Se < S < O, as electronegativity increases across a period.

Analyze the following statement: "The reactivity of nonmetals increases across a period." Which factors contribute to this trend? (Select all that apply)

undefined. A) Increase in atomic radius

undefined. B) Increase in electronegativity ✓

undefined. C) Increase in ionization energy ✓
undefined. D) Decrease in electron affinity

The reactivity of nonmetals increases due to an increase in electronegativity and ionization energy.

Compare and contrast the trends in electron affinity and ionization energy across a period. Provide examples to support your analysis.

Both electron affinity and ionization energy generally increase across a period, but they represent different processes: electron affinity is the energy change when an electron is added, while ionization energy is the energy required to remove an electron.

Part 3: Evaluation and Creation

Evaluate the following elements: Fluorine (F), Chlorine (Cl), and Bromine (Br). Which element would you expect to have the highest reactivity and why? (Select all that apply)

undefined. A) Fluorine ✓
undefined. B) Chlorine
undefined. C) Bromine
undefined. D) Reactivity is the same for all

Fluorine is expected to have the highest reactivity due to its high electronegativity and low atomic radius.

Design an experiment to demonstrate the trend in metallic character across a period. Describe the materials, procedure, and expected results.

An experiment could involve comparing the reactivity of metals across a period, using materials like sodium, magnesium, and aluminum, and observing their reactions with water or acids.

Based on periodic trends, which element would you predict to be the most reactive metal?

undefined. A) Lithium (Li)
undefined. B) Sodium (Na)
undefined. C) Potassium (K)
undefined. D) Rubidium (Rb) ✓

Rubidium (Rb) is predicted to be the most reactive metal due to its low ionization energy and large atomic radius.