Atomic Radius Quiz Answer Key PDF

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Which of the following statements about atomic radius are true?

A. Atomic radius increases down a group. ✓

B. Atomic radius decreases across a period. ✓

C. Atomic radius is the same for all elements in a period.

D. Atomic radius is affected by nuclear charge. ✓

What is the atomic radius?

A. The distance from the nucleus to the outermost electron shell. ✓

B. The distance between two nuclei in a molecule.

C. The distance from the nucleus to the first electron shell.

D. The distance between two bonded atoms.

What is the primary reason for the decrease in atomic radius across a period?

A. Increase in electron shells

B. Increase in nuclear charge ✓

C. Decrease in electron shielding

D. Decrease in electron repulsion

Which type of atomic radius is measured between two bonded atoms?

A. Ionic Radius

B. Covalent Radius ✓

C. Metallic Radius

D. Van der Waals Radius

Which of the following elements are likely to have a smaller atomic radius than sodium?

A. Magnesium ✓
B. Potassium
C. Aluminum ✓
D. Chlorine ✓

Which factor does NOT significantly affect atomic radius?

A. Nuclear charge
B. Electron shielding
C. Temperature ✓
D. Electron-electron repulsion

Which type of atomic radius is relevant for noble gases?

A. Covalent Radius
B. Ionic Radius
C. Metallic Radius
D. Van der Waals Radius ✓

What happens to the atomic radius as you move across a period from left to right?

A. It increases.
B. It decreases. ✓
C. It remains constant.
D. It fluctuates randomly.

Which factors influence the atomic radius of an element?

A. Nuclear charge ✓
B. Number of electron shells ✓
C. Electronegativity
D. Electron shielding ✓

Which types of atomic radii are used to describe different bonding situations?

A. Covalent Radius ✓
B. Ionic Radius ✓

C. Metallic Radius ✓

D. Van der Waals Radius ✓

What is the unit commonly used to measure atomic radius?

A. Meters

B. Nanometers

C. Picometers ✓

D. Kilometers

Which element is likely to have the largest atomic radius in the second period?

A. Lithium ✓

B. Carbon

C. Oxygen

D. Neon

Explain why atomic radius generally increases as you move down a group in the periodic table.

The atomic radius increases down a group because additional electron shells are added, increasing the distance between the nucleus and the outermost electrons.

Describe how the concept of electron shielding affects the atomic radius of an element.

Electron shielding occurs when inner electrons block the attraction between the nucleus and the outer electrons, allowing the atomic radius to increase.

How does the atomic radius relate to the ionization energy of an element? Provide an example.

Generally, a larger atomic radius means lower ionization energy because the outer electrons are further from the nucleus and less tightly bound. For example, cesium has a larger atomic radius and lower ionization energy compared to lithium.

Compare and contrast covalent radius and ionic radius. In what situations would each be used?

Covalent radius is used when atoms are bonded covalently, measuring half the distance between nuclei. Ionic radius is used for ions, varying based on whether the atom is a cation or an anions.

Which elements are likely to have a larger atomic radius than their corresponding cations?

A. Sodium ✓

B. Chlorine

C. Calcium ✓

D. Oxygen

Why might the atomic radius of a noble gas be measured differently compared to other elements?

Noble gases do not typically form bonds, so their atomic radius is measured using the Van der Waals radius, which is the distance between non-bondeded atoms.

Discuss the relationship between atomic radius and electronegativity, using specific elements as examples.

Generally, smaller atomic radii correlate with higher electronegativity because the nucleus more effectively attracts electrons. For example, fluorine has a small atomic radius and high electronegativity.

What are the characteristics of elements with large atomic radii?

A. Low ionization energy ✓

B. High electronegativity

C. Many electron shells ✓

D. High nuclear charge