

Electron Affinity Quiz Answer Key PDF

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Provide an example of an anomaly in electron affinity trends and explain the reason behind it.

The anomaly occurs between nitrogen and oxygen; nitrogen has a higher electron affinity than oxygen.

Explain why electron affinity generally increases across a period in the periodic table.

Electron affinity generally increases across a period in the periodic table because as you move from left to right, the effective nuclear charge increases, leading to a stronger attraction between the nucleus and the incoming electron.

Discuss why elements with nearly full outer shells have high electron affinities.

Elements with nearly full outer shells, such as halogens, have high electron affinities because they are one electron short of a full valence shell, making the addition of an electron highly favorable and energetically advantageous.

How does atomic size affect electron affinity, and why?

As atomic size increases, the distance between the nucleus and the outermost electrons increases, resulting in a weaker attraction for additional electrons and thus lower electron affinity.

Describe the role of electron affinity in determining an element's chemical reactivity.

Electron affinity plays a crucial role in determining an element's chemical reactivity by indicating how readily an atom can accept an electron, with higher electron affinity correlating to greater reactivity, especially in nonmetals.

Which of the following statements about electron affinity trends is true? (Select all that apply)

- A. Electron affinity increases across a period ✓
- B. Electron affinity decreases down a group ✓
- C. Electron affinity is higher for larger atoms
- D. Electron affinity is unaffected by electron configuration

Which unit is commonly used to measure electron affinity?

- A. Joules
- B. Newtons
- C. Electronvolts (eV) ✓
- D. Amperes

Which factor does NOT influence electron affinity?

- A. Atomic size
- B. Nuclear charge
- C. Electron configuration
- D. Number of neutrons ✓

Which of the following factors influence electron affinity? (Select all that apply)

- A. Atomic size ✓
- B. Nuclear charge ✓
- C. Number of isotopes
- D. Electron configuration ✓

What is electron affinity?

- A. The energy change when an electron is added to a neutral atom ✓
- B. The energy required to remove an electron from an atom
- C. The tendency of an atom to lose electrons
- D. The energy required to add a proton to an atom

Why might an element have a lower than expected electron affinity? (Select all that apply)

- A. It has a half-filled orbital ✓
- B. It is a noble gas ✓

- C. It has a high atomic number
- D. It has a small atomic radius

How can electron affinity be measured experimentally, and what challenges might arise in its measurement?

Electron affinity can be measured using photoelectron spectroscopy, where the energy of electrons emitted from atoms or molecules is analyzed, or by examining the energy changes in gas-phase reactions when an electron is added to an atom or ion. Challenges include the need for high precision in measurements and the potential influence of surrounding molecular interactions.

Which element is likely to have the highest electron affinity?

- A. Fluorine ✓**
- B. Neon
- C. Sodium
- D. Lithium

What are some applications of electron affinity? (Select all that apply)

- A. Designin semiconductors ✓**
- B. Predictin weather patterns
- C. Understanding chemical reactivity ✓**
- D. Biological electron transfer processes ✓**

Which elements typically have low or positive electron affinities? (Select all that apply)

- A. Noble gases ✓**
- B. Alkali metals ✓**
- C. Halogens
- D. Transition metals

Which of the following elements has an electron affinity anomaly due to a half-filled p orbital?

- A. Oxygen
- B. Nitrogen ✓**
- C. Carbon

D. Boron

In which direction does electron affinity generally increase across the periodic table?

- A. From right to left
- B. From top to bottom
- C. From left to right ✓**
- D. It remains constant

Why do noble gases have low electron affinities?

- A. They have high atomic masses
- B. They have complete valence shells ✓**
- C. They are highly reactive
- D. They have low atomic numbers

Which elements are likely to have high electron affinities? (Select all that apply)

- A. Chlorine ✓**
- B. Argon
- C. Oxygen ✓**
- D. Potassium

What happens to electron affinity as you move down a group in the periodic table?

- A. It increases
- B. It decreases ✓**
- C. It remains the same
- D. It fluctuates randomly