

Name: _____ Date: _____

Sticking Together: The 8th Grade Geometry of Atomic Bonds Quiz

Examine polyatomic patterns and lattice energy across 10 challenges focused on predicting molecular behavior and electron arrangement.

1. When considering the lattice energy of ionic compounds, which of the following substances would require the most energy to separate its ions, based on the charge and size of the ions involved?

- A. Potassium iodide (KI)
- B. Aluminum nitride (AlN)
- C. Sodium bromide (NaBr)
- D. Lithium chloride (LiCl)

2. In a molecule of Nitrogen gas (N₂), the two atoms are held together by a _____ covalent bond to satisfy the octet rule.

- A. Single
- B. Double
- C. Triple
- D. Quadruple

3. A polar covalent bond occurs when electrons are shared equally between two atoms of the same electronegativity.

- A. True
- B. False

4. Which of the following best explains why metallic bonds allow metals like Silver (Ag) to be hammered into thin sheets without breaking?

- A. Rigid crystalline structures lock atoms in place
- B. The delocalized 'sea of electrons' acts as a flexible glue
- C. Ionic repulsion prevents the atoms from touching
- D. Covalent networks provide multi-directional strength

5. The _____ of an atom is a measure of its ability to attract shared electrons in a chemical bond.

- A. Ionization energy
- B. Electron affinity
- C. Atomic radius
- D. Electronegativity

6. Polyatomic ions, such as Sulfate (SO₄²⁻), are groups of atoms held together by covalent bonds that function as a single charged unit.

- A. True
- B. False

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7. Which molecule contains a coordinate covalent bond, where one atom provides both electrons for the shared pair?

- A. Carbon monoxide (CO)
- B. Hydrogen gas (H₂)
- C. Oxygen gas (O₂)
- D. Methane (CH₄)

8. Sulfur hexafluoride (SF₆) is an example of a molecule that has an _____ octet, because the central atom is surrounded by 12 electrons.

- A. Incomplete
- B. Expanded
- C. Unstable
- D. Ionic

9. If an element from Group 2 reacts with an element from Group 17, what is the most likely chemical formula of the resulting compound?

- A. XY
- B. X₂Y
- C. XY₂
- D. X₂Y₃

10. The high boiling point of Ammonia (NH₃) compared to Phosphine (PH₃) is primarily due to the presence of hydrogen bonding.

- A. True
- B. False