Name: _____ **Date:** _____

Answer Key: Zap the Octet: 9th Grade Chemical Bonding Essentials Quiz

How do elements achieve a full valence shell? Recall the basic mechanisms behind electron sharing and transfer in this fundamental assessment.

---

1. Which type of chemical bond forms when one atom 'steals' an electron from another, resulting in an electrostatic attraction between a cation and an anion?

Answer: B) Ionic bond

Ionic bonds are characterized by the complete transfer of valence electrons, resulting in oppositely charged ions that attract one another.

2. In a molecule of nitrogen gas (N2), the two nitrogen atoms are held together by a _____ bond because they share electrons equally.

Answer: C) Covalent

Covalent bonds occur when nonmetal atoms share electrons to achieve a stable octet configuration.

3. True or False: Most atoms are more stable when they have eight electrons in their outermost shell, a concept known as the Octet Rule.

Answer: A) True

The Octet Rule states that atoms tend to gain, lose, or share electrons to reach a full valence shell of eight electrons, mimicking noble gas stability.

4. What is the primary reason why silver (Ag) is such an excellent conductor of electricity?

Answer: B) It has a 'sea' of delocalized electrons

Metallic bonding involves delocalized electrons that are free to move throughout the entire metal lattice, facilitating electrical conductivity.

5. Potassium iodide (KI) is a crystalline solid with a high melting point. Based on these properties, KI is likely held together by _____ bonds.

Answer: C) Ionic

Name: _____ **Date:** _____

Ionic compounds typically form brittle crystalline structures and have high melting points due to the strong attraction between ions.

6. True or False: Covalent bonds are most commonly formed between a metal and a nonmetal.

Answer: B) False

Covalent bonds usually form between two nonmetals. Metal/nonmetal combinations typically result in ionic bonding.

7. Which of these substances is an example of a diatomic molecule held together by a covalent bond?

Answer: C) Chlorine gas (Cl2)

Chlorine (Cl2) consists of two identical nonmetal atoms sharing a pair of electrons, making it a diatomic covalent molecule.

8. The property of a metal that allows it to be hammered into thin sheets without breaking is called _____, which is possible because of its flexible bonding.

Answer: A) Malleability

Malleability is a physical property of metals where the sea of electrons allow atoms to slide past each other without resisting the bond.

9. True or False: In a double covalent bond, atoms share a total of four electrons (two pairs).

Answer: A) True

A single bond involves sharing 2 electrons, while a double bond involves sharing two pairs, or 4 total electrons.

10. When an atom of Calcium (Ca) loses two electrons to form a bond, what is the resulting charge of the ion?

Answer: D) +2

Electrons carry a negative charge. If a neutral atom loses two negative particles, it becomes a positive ion with a +2 charge.