

What are the types of chemical bonding?

Worksheet

The three main types are ionic bonding (electron transfer between atoms), covalent bonding (electron sharing between atoms), and metallic bonding (delocalized electrons in a metal lattice).

Questions

- Which type of bonding involves electron transfer?
 - Covalent
 - Ionic
 - Metallic
 - Polar
- H (hydrogen gas) uses which bonding type?
 - Ionic
 - Metallic
 - Covalent
 - None
- Ionic compounds typically have high melting points because
 - Weak electron sharing
 - Strong electrostatic attraction between ions
 - Metallic bonding
 - No electron involvement
- What is the 'electron sea' in metallic bonding?
 - Localized electrons on atoms
 - Delocalized electrons shared among all atoms
 - Ionic charges
 - Broken bonds
- NaCl (table salt) forms when sodium donates an electron to chlorine. What type of bonding is this?
- In HO, two hydrogen atoms and one oxygen atom share electrons. What type of bonding?
- In solid copper, metal atoms release electrons into a shared 'electron sea'. What type of bonding?
- Define: What is ionic bonding?
- Define: What is covalent bonding?
- Define: What is metallic bonding?

Answer Key

1. B) Ionic - Ionic bonding occurs when one atom transfers electron(s) to another.
2. C) Covalent - Two hydrogen atoms share one electron pair, forming a covalent bond.
3. B) Strong electrostatic attraction between ions - Ions in a lattice experience strong Coulomb forces, requiring high heat to break.
4. B) Delocalized electrons shared among all atoms - Valence electrons in metals move freely throughout the lattice.
5. Sodium (metal) loses one electron Na ion Chlorine (nonmetal) gains one electron Cl ion Opposite charges attract Ionic bonding
6. H and O both share electron pairs No electron transfer occurs Bonds form from shared electron clouds Covalent bonding
7. Cu atoms donate valence electrons Electrons move freely throughout the lattice Delocalized electrons hold atoms together Metallic bonding
8. Transfer of electrons from one atom to another, creating oppositely charged ions that attract.
9. Sharing of electron pairs between two atoms, holding them together.
10. Metal atoms surrounded by a 'sea' of delocalized electrons that move freely.

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