

Bonding Unit Objectives Honors Chemistry

By the end of this unit students should be able to:

- Classify bond breaking and forming as endothermic or exothermic
- Understand that atoms form bonds to attain stability
- Write the noble gas electron configuration achieved when an atom bonds
- Determine bond type using electronegativity difference between atoms
- Distinguish between ionic, polar covalent, nonpolar covalent, and metallic bonds
- Draw electron dot diagrams for ionic compounds
- Draw electron dot diagrams for covalent compounds
- Understand how and why hybridization occurs in the valence electrons of carbon, boron, and beryllium when forming bonds
- Distinguish between sigma and pi bonds
- Explain and use VSEPR theory to determine shape and bond angle of covalent molecules
 - Shapes to know include: linear, bent, trigonal pyramidal, trigonal planar, tetrahedral
- Determine the molecular polarity of a molecule based on bond polarity and shape
- Identify the type of intermolecular attractions between molecules of a substance
 - Types of intermolecular forces to know include: dipole-dipole interactions, hydrogen bonding, dispersion forces
- Explain the relationship between strength of intermolecular attractions and bonds with physical properties of a substance
- Explain how ionic solids dissolve through molecule-ion attractions
- Compare the structure and properties of ionic, molecular, network covalent, and metallically bonded solids
 - Properties to know include: melting point, boiling point, solubility, and conductivity in solid, liquid, and dissolved states
- Define *allotrope* and identify some common allotropes of carbon
- Define *coordinate covalent bond* and write an equation for coordinate covalent bonding between a proton and a molecule