

CHAPTER OVERVIEW

1: Review of Chemical Bonding

Learning Objectives

- Be able to draw Lewis dot structures, assign formal charges, predict molecular geometries (including bond angles), and calculate bond orders for molecules, including hypervalent molecules and ions.
- Describe hypervalent molecules using no-bond resonance.
- Understand and articulate how predictions of molecular structure and bonding can be experimentally verified.
- Learn to construct hybrid orbitals from s and p atomic orbitals.
- Use the isoelectronic principle to design new molecules and solids.
- Rationalize bond strength and chemical reactivity using bond polarity arguments.
- Interrelate bond length and bond strength.

There is no topic more fundamental to Chemistry than the nature of the chemical bond, and the introduction you find here will provide you with an overview of the fundamentals and a basis for further study.

[1.1: Prelude to Chemical Bonding](#)

[1.2: Valence Bond Theory- Lewis Dot Structures, the Octet Rule, Formal Charge, Resonance, and the Isoelectronic Principle](#)

[1.3: The Shapes of Molecules \(VSEPR Theory\) and Orbital Hybridization](#)

[1.4: Bond Polarity and Bond Strength](#)

[1.5: Discussion Questions](#)

[1.6: Problems](#)

[1.7: References](#)

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