

CHAPTER OVERVIEW

8: Advanced Theories of Covalent Bonding

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General Chemistry

We have examined the basic ideas of bonding, showing that atoms share electrons to form molecules with stable Lewis structures and that we can predict the shapes of those molecules by valence shell electron pair repulsion (VSEPR) theory. These ideas provide an important starting point for understanding chemical bonding. But these models sometimes fall short in their abilities to predict the behavior of real substances. How can we reconcile the geometries of *s*, *p*, and *d* atomic orbitals with molecular shapes that show angles like 120° and 109.5° ? Furthermore, we know that electrons and magnetic behavior are related through electromagnetic fields.

[8.1: Prelude to Covalent Bonding](#)

[8.2: Valence Bond Theory](#)

[8.3: Hybrid Atomic Orbitals](#)

[8.4: Multiple Bonds](#)

[8.5: Molecular Orbital Theory](#)

[8.E: Advanced Theories of Covalent Bonding \(Exercises\)](#)

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