

## CHAPTER OVERVIEW

### 8: Chemical Bonding I - The Lewis Model



The [Lewis Theory](#) used observations from chemists and physicists to form a theory about chemical bonding. This work was essentially a compilation of the knowledge at the time. It revolved around the importance of valence electrons in chemical bonding. These are the electrons that are in the outermost shell. For example Na may have 11 electrons, but only one is a valence electron, the one in  $3s^1$ . Meanwhile P has 15 electrons, but has five valence electrons,  $3s^2$  and  $3p^2$ . The bonding of an element is based on how they fill their octets i.e. achieve a noble gas electron configurations. Lewis went on to explain how certain elements such as Boron did not necessarily follow these same rules. By drawing schematics of molecules called Lewis Dot Structures, important characteristics of molecules can be described.

#### Chapter Sections

- [8.1: Lewis Symbols](#)
- [8.2: Covalent Bonding and Lewis Dot Structures](#)
  - [8.2.1: Exceptions to Octet](#)
- [8.3: Resonance Structures and Formal Charge](#)
- [8.4: Polar Covalent Bonds](#)
- [8.5: Bond Energies, Strengths, and Lengths](#)

#### References:

- Lewis, Gilbert Newton. *Valence and the Structure of Atoms and Molecules*. New York: Chemical Catalog, 1923. Print.
- Pauling, Linus. *The Nature of the Chemical Bond: and the Structure of Molecules and Crystals : Introduction to Modern Structural Chemistry*. Ithaca, NY: Cornell UP, 1960. Print.
- Petrucci, Ralph H. *General Chemistry: Principles and Modern Applications*. Toronto, Ont.: Pearson Canada, 2011. Print.

#### Outside Links:

- [http://en.Wikipedia.org/wiki/Lewis\\_structure](http://en.Wikipedia.org/wiki/Lewis_structure)
- <http://osulibrary.oregonstate.edu/sp...-19160400.html>

#### Contributors

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