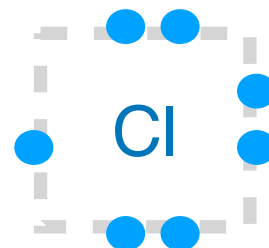


Lewis Diagrams

Lewis diagrams are a shortcut that chemists use to outline the valence electrons of an element. Once an orbit in a Bohr-Rutherford diagram is full it is considered stable and the electrons here will not react.

Therefore, chemists are often interested in just the valence electrons of an element. Lewis diagrams show the paired valence electrons, but places them on an 'invisible box' rather than in a circle around the nucleus. Also, protons and neutrons are not used to represent valence electrons, instead the element symbol is used



Let's practice. Draw Lewis diagrams for the following.

H

He

Li

Be

B

C

N

O

F

Ne

Na

Mg

Al

Si

P

S

Cl

Ar

K

Ca

How elements form compounds

The tendency of some atoms to lose and gain electrons to become stable is one method of how compounds are formed.

Atoms: Smallest unit of matter

Molecule: Made up of one or more atoms

Ion: Atom that carries a charge

Ionic Compounds: a compound that consists of a positive and negative ion

- 1) Electrons transfer from a **metal** to a **non-metal**.
- 2) Positive and negative ions are formed.
- 3) The ions are attracted to one another because they have opposite charges.

Example: Sodium Chloride (NaCl)

Metal: Na

-metal loses electrons

-1 valence electron

-Easiest to lose 1 electron

Non-metal: Cl

-non-metals gain electrons

-7 valence electrons

-Easiest to gain 1

Example: Calcium and oxygen (CaO)

Example: Lithium and sulfur (LiS₂)

Covalent Compounds: a compound that consists of a positive and negative ion

- 1) Atoms **share** one or more electron with each other to form a bond.
- 2) By sharing, each atom is left with a full valence shell.
- 3) Happens between **two non-metals**.

Example: Hydrogen + Chlorine

Non-Metal: Hydrogen
-metal loses electrons
-1 valence electron
-Easiest to lose 1 electron

Non-metal: Chlorine
-non-metals gain electrons
-7 valence electrons
-Easiest to gain 1

Example: Carbon + 2 Oxygen

Example: Carbon + 4 Hydrogen

J. Kropac
SNC 1D

Diatomic Molecules: a molecule that forms when two atoms of the same element join together. This is not a compound because it contains atoms of only one element.

Example: Cl₂

Example: Oxygen + Oxygen

Example: Nitrogen + Nitrogen

Common diatomic molecules:

H₂ O₂ F₂ Br₂ I₂ N₂ Cl₂

Practice makes perfect!

Element	Atomic Symbol	Total # of electrons in neutral atom	# of valence electrons	Charge of Ion
Chlorine				
Potassium				
Magnesium				
Flourine				
Aluminum				
Sodium				
Nitrogen				
Oxygen				
Hydrogen				
Carbon				
Iodine				