

Lewis Dot Structures

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Things to keep in mind when drawing Lewis structure

1. Always count valence electrons
2. Know the preferred number of bonds to these elements
3. **N O**, these elements may have a variable number of bonds
4. If the substance has hydrogen list first in its formula:
 - a. the substance is characterized as an acid
 - b. the H is bound to oxygen in the substances formula
5. F O N Cl Br I S C H for determining bond polarity

C	N	O	F	H
4	3	2	1	1

(2)	(1)
(4)	(3)

F O N Cl Br I S C H for determining
bond polarity between **nonmetal** atoms

Large difference in electronegativity between H—F most polar bond
between C—F very polar bond

F O N Cl Br I S C H

Little difference in electronegativity
Less polar

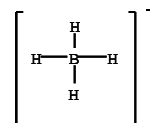
Between identical atoms, C-C, F-F bonding is nonpolar

Done

Done

1. Calculate the total number of valence electrons.
2. Assemble the bonding framework.
3. Connect the other atoms to the central by drawing a single line. Each line represents a single bond made up of two electrons being shared between two atoms.
4. Give the outer most atoms, EXCEPT for hydrogen, three sets of paired electrons.
5. Count valence electrons in your provisional structure. See if all valence electrons calculate in step 1 are present.
6. Add missing electrons to the central atom.
7. Apply the octet rule to check to see that each atom has eight electrons surrounding it.
8. Share neighboring electrons by moving electrons to satisfy the octet about each atom.
9. Place a bracket around ions, followed by ion charge.

$$\begin{array}{r} \text{BH}_3^- \\ \text{group} \\ \# \\ 1\text{B} \cdot 3 = 3 \\ 4\text{H} \cdot 1 = 4 \\ + 1 - = 1 \\ \hline \text{VE} = 8 \end{array}$$



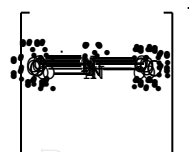
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$$\begin{array}{r} \text{NO}_2^- \\ \text{group} \\ \text{\#} \\ 1\text{N} \cdot 5 = 5 \\ 2\text{O} \cdot 6 = 12 \\ + 1\text{e}^- = 1 \\ \hline \text{VE} = 18 \end{array}$$

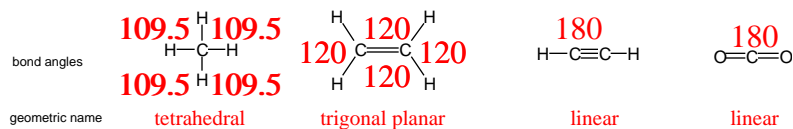


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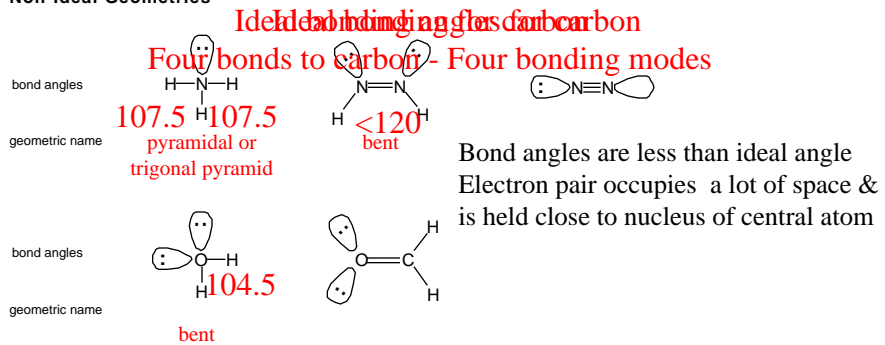
VSEPR = valence shell electron pair repulsion

Determine the angles between bonds, name the geometry about the central atom and give the its hybridization.

Ideal Geometries



Non-Ideal Geometries



Done