

Lewis Structures Practice

Steps for Writing Lewis Structures

- 1.) Obtain the sum of the valence electrons from all of the atoms. Do not worry about keeping track of which electrons come from which atoms. It is the total number of valence electrons that is important.
- 2.) Identify the central atom/s (They are few in number (like only one) and can form more than one bond (NOT Hydrogen)!)!
- 3.) Use one pair of electrons to form a bond between each pair of bound atoms. For convenience, a line (instead of a pair of dots) is often used to indicate each pair of bonding electrons.
- 4.) Arrange the remaining electrons to satisfy the duet rule for hydrogen and the octet rule for each second row element.

1. Name and draw the Lewis Structures for the following molecules and ions!

HCN 1 $H-C \equiv N:$ hydrogen cyanide	CBr₄ $\begin{array}{c} Br \\ \\ Br-C-Br \\ \\ Br \end{array}$ carbon tetrabromide	HNO₃ Nitric Acid 24 $\begin{array}{c} :O: \\ \\ N=O \\ \\ H-O: \end{array}$
SO₂²⁻ sulfite 20 $\left[\begin{array}{c} :O: \\ \\ :O-S-O: \\ \\ :O: \end{array} \right]^{-2}$	CH₃OH Ethanol 14 $\begin{array}{c} H \\ \\ H-C-O-H \\ \\ H \end{array}$	N₃⁻ Azide ion 16 $\left[:N \equiv N - \ddot{N}: \right]^{-1}$
NO₃⁻ Nitrate ion 24 $\left[\begin{array}{c} :O: \\ \\ :O-N=O: \\ \\ :O: \end{array} \right]^{-1}$	NO₂⁻ Nitrite ion 18 $\left[:O=N-O: \right]^{-1}$	NOF Nitrogen monofluoride 18 $:O=N-F:$

← Has many

FNO_2 Fluoro nitrite 7 5 12 24 $\text{:}\ddot{\text{F}}\text{:} - \ddot{\text{O}} - \text{N} = \ddot{\text{O}}\text{:}$ there are other options	$\text{C}_2\text{O}_4^{2-}$ oxalate ion 8 26 34 $\left[\begin{array}{c} \ddot{\text{O}} \\ \parallel \\ \text{:}\ddot{\text{O}} = \text{C} - \text{C} - \ddot{\text{O}}\text{:} \\ \parallel \\ \ddot{\text{O}} \end{array} \right]^{-2}$	H_2PO_4^- dihydrogen phosphate 2 26 32 $\left[\begin{array}{c} \ddot{\text{O}}\text{:} \\ \\ \text{H} - \ddot{\text{O}} - \text{P} - \ddot{\text{O}} - \text{H} \\ \\ \ddot{\text{O}}\text{:} \end{array} \right]^{-1}$
ClO^- hypochlorite ion 7 16 + 1 = 14 $\left[\text{:}\ddot{\text{Cl}} - \ddot{\text{O}}\text{:} \right]^{-1}$	ClO_2^- chlorite ion 7 12 20 $\left[\text{:}\ddot{\text{O}} = \ddot{\text{Cl}} - \ddot{\text{O}}\text{:} \right]^{-1}$	ClO_3^- chlorate ion 7 18 26 $\left[\begin{array}{c} \ddot{\text{O}}\text{:} \\ \\ \text{:}\ddot{\text{O}} - \text{Cl} - \ddot{\text{O}}\text{:} \\ \\ \ddot{\text{O}}\text{:} \end{array} \right]^{-1}$
32 ClO_4^- perchlorate ion 8 24 32 $\left[\begin{array}{c} \ddot{\text{O}}\text{:} \\ \\ \text{:}\ddot{\text{O}} = \text{C} - \ddot{\text{O}}\text{:} \\ \\ \ddot{\text{O}}\text{:} \end{array} \right]^{-1}$	F_2 Fluorine $\text{:}\ddot{\text{F}} - \ddot{\text{F}}\text{:}$	SF_6 Sulfur hexafluoride $\begin{array}{c} \text{:}\ddot{\text{F}}\text{:} \\ \\ \text{:}\ddot{\text{F}} - \text{S} - \ddot{\text{F}}\text{:} \\ \quad \\ \text{:}\ddot{\text{F}}\text{:} \quad \text{:}\ddot{\text{F}}\text{:} \end{array}$
H_3O^+ Hydronium ion 8 12 20 $\left[\begin{array}{c} \text{H} \\ \\ \text{H} - \ddot{\text{O}} - \text{H} \end{array} \right]^+$	SO_4^{2-} Sulfate ion 32 32 $\left[\begin{array}{c} \ddot{\text{O}}\text{:} \\ \\ \text{:}\ddot{\text{O}} - \text{S} - \ddot{\text{O}}\text{:} \\ \\ \ddot{\text{O}}\text{:} \end{array} \right]^{-2}$	SO_3^{2-} Sulfite ion 26 26 $\left[\begin{array}{c} \ddot{\text{O}}\text{:} \\ \\ \text{:}\ddot{\text{O}} - \text{S} - \ddot{\text{O}}\text{:} \end{array} \right]^{-2}$