

# Lewis Structure Worksheet #1

Read the Instructions for Drawing Lewis Structures worksheet carefully and complete Lewis structures for each of the following molecules:

## Group A: Simple Molecules

CH <sub>4</sub>	NH <sub>3</sub>	H <sub>2</sub> O	SIF <sub>4</sub> 32 val e <sup>-</sup>	NCl <sub>3</sub> 26 val
$\begin{array}{c} \text{H} \\   \\ \text{H}-\text{C}-\text{H} \\   \\ \text{H} \end{array}$	$\begin{array}{c} \text{H}-\ddot{\text{N}}-\text{H} \\   \\ \text{H} \end{array}$	$\text{H}-\ddot{\text{O}}-\text{H}$	$\begin{array}{c} \text{F} \\   \\ \text{F}-\text{S}-\text{F} \\   \\ \text{F} \end{array}$	$\begin{array}{c} \text{Cl} \\   \\ \text{Cl}-\ddot{\text{N}}-\text{Cl} \\   \\ \text{Cl} \end{array}$

## Group B: Polyatomic Ions

PO <sub>4</sub> <sup>3-</sup> 32 e <sup>-</sup>	ClO <sub>3</sub> <sup>-</sup> 25 e <sup>-</sup> + 1 e <sup>-</sup> = 26	ClO <sub>4</sub> <sup>-</sup> 31 + 1 = 32 e <sup>-</sup>	SO <sub>3</sub> <sup>2-</sup> 24 e <sup>-</sup> + 2 e <sup>-</sup> = 26 e <sup>-</sup>
$\left[ \begin{array}{c} \text{O} \\   \\ \text{O}-\text{P}-\text{O} \\   \\ \text{O} \end{array} \right]^{3-}$	$\left[ \begin{array}{c} \text{O} \\   \\ \text{O}-\text{Cl}-\text{O} \\   \\ \text{O} \end{array} \right]^{-1}$	$\left[ \begin{array}{c} \text{O} \\   \\ \text{O}-\text{Cl}-\text{O} \\   \\ \text{O} \end{array} \right]^{-1}$	$\begin{array}{c} \text{O} \\   \\ \text{O}-\text{S}-\text{O} \\   \\ \text{O} \end{array}$

## Group C: Multiple Bonds

H <sub>2</sub> CO 12	HCN 10 e <sup>-</sup>	CO 10 e <sup>-</sup>	CO <sub>2</sub> 16
$\begin{array}{c} \text{H} \\   \\ \text{C}=\text{O} \\   \\ \text{H} \end{array}$	$\text{H}-\text{C}\equiv\text{N}:$	$:\text{C}\equiv\text{O}:$	$\ddot{\text{O}}=\text{C}=\ddot{\text{O}}$

**Group D: Incomplete Octets**

<p><math>\text{BCl}_3</math>  <math>3 + 7(3) = 24 e^-</math></p>	<p><math>\text{BeF}_2</math> <math>2 + 7(2) = 16 e^-</math></p>	<p><math>\text{IF}-\text{Be}-\text{FI}</math></p>
<p><math>\text{ICl}_3</math>  <math>3 + 7(3) = 24 e^-</math></p>	<p><math>\text{ICl}_3</math> <math>2 + 7(3) = 23 e^-</math></p>	<p><math>\text{IF}-\text{Be}-\text{FI}</math></p>

**Group E: Expanded Octets** See webpage for Youtube videos (L.T. 5.2)

<p><math>\text{SF}_6</math>  <math>6 + 7(6) = 48 \text{ val. } e^-</math></p>	<p><math>\text{PCl}_5</math> <math>5 + 7(5) = 40 e^-</math></p>	<p><math>\text{BrF}_3</math> <math>7 + 3(7) = 42 e^-</math></p>	<p><math>\text{XeF}_4</math>  <math>8 + 7(4) = 36 e^-</math></p>	<p><math>\text{ClF}_3</math>  <math>7 + 7(3) = 28 e^-</math></p>
<p><math>\text{IF}_5</math>  <math>7 + 7(5) = 42 e^-</math></p>	<p><math>\text{PCl}_5</math> <math>5 + 7(5) = 40 e^-</math></p>	<p><math>\text{BrF}_3</math> <math>7 + 3(7) = 42 e^-</math></p>	<p><math>\text{XeF}_4</math>  <math>8 + 7(4) = 36 e^-</math></p>	<p><math>\text{ClF}_3</math>  <math>7 + 7(3) = 28 e^-</math></p>

**Group F: Multiple Central Atoms**

<p><math>\text{C}_2\text{H}_6</math></p>	<p><math>\text{C}_3\text{H}_8</math></p>	<p><math>\text{C}_2\text{H}_5\text{OH}</math></p>	<p><math>\text{C}_2\text{H}_4</math></p>	<p><math>\text{C}_2\text{F}_2</math></p>
<p><math>\text{C}_2\text{H}_6</math></p>	<p><math>\text{C}_3\text{H}_8</math></p>	<p><math>\text{C}_2\text{H}_5\text{OH}</math></p>	<p><math>\text{C}_2\text{H}_4</math></p>	<p><math>\text{C}_2\text{F}_2</math></p>