

Wkst: Lewis Structures and Molecular Geometry

Formula	Lewis Structure		Molecular Geometry		
	# Valence e's	Diagram	Steric #	Lone pair	Geometry
HBr	$\begin{array}{r} \text{H } 1 \times 1 = 1 \\ \text{Br } 7 \times 1 = 7 \\ \hline 8 \end{array}$		2	0	Linear
NH ₃	$\begin{array}{r} \text{N } 5 \times 1 = 5 \\ \text{H } 1 \times 3 = 3 \\ \hline 8 \end{array}$		4	1	trigonal pyramid
CH ₄	$\begin{array}{r} \text{C } 4 \times 1 = 4 \\ \text{H } 1 \times 4 = 4 \\ \hline 8 \end{array}$		4	0	tetrahedral
SO ₄ ²⁻	$\begin{array}{r} \text{S } 6 \times 1 = 6 \\ \text{O } 6 \times 4 = 24 \\ -2 \Rightarrow 2 \text{ more} = \frac{2}{32} \end{array}$		4	0	tetrahedral
PO ₄ ³⁻	$\begin{array}{r} \text{P } 5 \times 1 = 5 \\ \text{O } 6 \times 4 = 24 \\ -3 = \frac{3}{32} \end{array}$		4	0	tetrahedral
H ₂ O	$\begin{array}{r} \text{H } 1 \times 2 = 2 \\ \text{O } 6 \times 1 = 6 \\ \hline 8 \end{array}$		4	2	Bent
NO ₃ ⁻¹	$\begin{array}{r} \text{N } 5 \times 1 = 5 \\ \text{O } 6 \times 3 = 18 \\ -1 = \frac{1}{24} \end{array}$		3	0	trigonal Planer
O ₂	$\text{O } 6 \times 2 = 12$		2	0	Linear
O ₃	$\text{O } 6 \times 3 = 18$		3	1	Bent

Key

H_2CO (C=center)	$\text{H } 1 \times 2 = 2$ $\text{C } 4 \times 1 = 4$ $\text{O } 6 \times 1 = 6$ <hr/> 12	$\begin{array}{c} \cdot\cdot \\ \text{O} \\ \parallel \\ \text{H}-\text{C}-\text{H} \end{array}$	3	0	triangular planer
N_2	$\text{N } 5 \times 2 = 10$	$:\text{N} \equiv \text{N}:$	2	0	Linear
CCl_4	$\text{C } 4 \times 1 = 4$ $\text{Cl } 7 \times 4 = 28$ <hr/> 32	$\begin{array}{c} :\ddot{\text{Cl}}: \\ \\ :\ddot{\text{Cl}}-\text{C}-\ddot{\text{Cl}}: \\ \\ :\ddot{\text{Cl}}: \end{array}$	4	0	tetrahedral
PH_3	$\text{P } 5 \times 1 = 5$ $\text{H } 1 \times 3 = 3$ <hr/> 8	$\begin{array}{c} \cdot\cdot \\ \text{P} \\ \\ \text{H} \end{array}$	4	1	trigonal pyramid
SO_2	$\text{S } 6 \times 1 = 6$ $\text{O } 6 \times 2 = 12$ <hr/> 18	$\begin{array}{c} \cdot\cdot \\ \text{O} \\ \parallel \\ \cdot\cdot \\ \text{O}-\text{S} \end{array}$	3	1	Bent
NH_4^+	$\text{N } 5 \times 1 = 5$ $\text{H } 1 \times 4 = 4$ $+1 = -1$ <hr/> 8	$\left[\begin{array}{c} \text{H} \\ \\ \text{H}-\text{N}-\text{H} \\ \\ \text{H} \end{array} \right]^+$	4	0	tetrahedral

Means gave
away 1 e