

Name: KEYChemistry/Lockard  
Molecular Geometry

Date: \_\_\_\_\_

Formula/Name	Total Valence e <sup>-</sup>	Structural formula of molecule or ion	Molecular Geometry	Polarity	IMFs (LDF, Dp-Dp, HB)
H <sub>2</sub>	H = 1e <sup>-</sup> * 2 = 2e <sup>-</sup> (Total)	H-H	Linear	Nonpolar	LDF
Cl <sub>2</sub>		$\text{:}\ddot{\text{Cl}}-\ddot{\text{Cl}}\text{:}$	Linear	NP	LDF
O <sub>2</sub>		$\ddot{\text{O}}=\ddot{\text{O}}$	Linear	NP	LDF
N <sub>2</sub>		$\text{:N}\equiv\text{N:}$	Linear	NP	LDF
HCl		$\text{H}-\ddot{\text{Cl}}\text{:}$	Linear	P	LDF DP-DP
BrCl		$\text{:}\ddot{\text{Br}}-\ddot{\text{Cl}}\text{:}$	Linear	NP (Not different enough)	LDF
HBr		$\text{H}-\ddot{\text{Br}}\text{:}$	Linear	P	LDF DP-DP
H <sub>2</sub> O		$\text{H}-\ddot{\text{O}}-\text{H}$	Bent	P	ALL
CO <sub>2</sub>		$\ddot{\text{O}}=\text{C}=\ddot{\text{O}}$	Linear	NP	LDF
H <sub>2</sub> S		$\text{H}-\ddot{\text{S}}-\text{H}$	Bent	P	LDF DP-DP
NH <sub>3</sub>		$\begin{array}{c} \text{H}-\ddot{\text{N}}-\text{H} \\ \text{H} \end{array}$	Trigonal Pyramidal	P	ALL
CH <sub>4</sub>		$\begin{array}{c} \text{H} \\   \\ \text{H}-\text{C}-\text{H} \\   \\ \text{H} \end{array}$	Tetrahedral	NP	LDF

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CCl <sub>4</sub>		$\begin{array}{c} \text{:}\ddot{\text{Cl}}\text{:} \\   \\ \text{:}\ddot{\text{Cl}}\text{:} - \text{C} - \text{:}\ddot{\text{Cl}}\text{:} \\   \\ \text{:}\ddot{\text{Cl}}\text{:} \end{array}$	Tetrahedral	NP	LDF
CH <sub>3</sub> Cl		$\begin{array}{c} \text{H} \\   \\ \text{H} - \text{C} - \text{H} \\   \\ \text{:}\ddot{\text{Cl}}\text{:} \end{array}$	Tetrahedral	P	LDF Dp-Dp
C <sub>2</sub> H <sub>6</sub>		$\begin{array}{c} \text{H} \quad \text{H} \\   \quad   \\ \text{H} - \text{C} - \text{C} - \text{H} \\   \quad   \\ \text{H} \quad \text{H} \end{array}$	Tetrahedral	NP	LDF
C <sub>2</sub> H <sub>4</sub>		$\begin{array}{c} \text{H} \quad \text{H} \\ \diagdown \quad \diagup \\ \text{C} = \text{C} \\ \diagup \quad \diagdown \\ \text{H} \quad \text{H} \end{array}$	Trigonal Planar	NP	LDF
CH <sub>2</sub> O		$\begin{array}{c} \text{:}\ddot{\text{O}}\text{:} \\    \\ \text{C} \\ / \quad \backslash \\ \text{H} \quad \text{H} \end{array}$	Trigonal Planar	P	LDF Dp-Dp
SOCl <sub>2</sub>	single bond	$\begin{array}{c} \text{:}\ddot{\text{O}}\text{:} \\   \\ \text{S} \\ / \quad \backslash \\ \text{:}\ddot{\text{Cl}}\text{:} \quad \text{:}\ddot{\text{Cl}}\text{:} \end{array}$	Trigonal pyramidal	P	LDF Dp-Dp
NO <sub>3</sub> <sup>-1</sup>		$\left[ \begin{array}{c} \text{:}\ddot{\text{O}}\text{:} \\    \\ \text{N} \\ / \quad \backslash \\ \text{:}\ddot{\text{O}}\text{:} \quad \text{:}\ddot{\text{O}}\text{:} \end{array} \right]^{-1}$	Trigonal Planar	X	X
PO <sub>3</sub> <sup>-3</sup>		$\left[ \begin{array}{c} \text{:}\ddot{\text{O}}\text{:} \\   \\ \text{P} \\   \\ \text{:}\ddot{\text{O}}\text{:} \\ / \quad \backslash \\ \text{:}\ddot{\text{O}}\text{:} \quad \text{:}\ddot{\text{O}}\text{:} \end{array} \right]^{-3}$	Trigonal pyramidal	X	X
SO <sub>3</sub> <sup>-2</sup>	single bond	$\left[ \begin{array}{c} \text{:}\ddot{\text{O}}\text{:} \\   \\ \text{S} \\   \\ \text{:}\ddot{\text{O}}\text{:} \\ / \quad \backslash \\ \text{:}\ddot{\text{O}}\text{:} \quad \text{:}\ddot{\text{O}}\text{:} \end{array} \right]^{-2}$	Trigonal pyramidal	X	X
NO <sub>2</sub> <sup>-1</sup>		$\left[ \begin{array}{c} \text{:}\ddot{\text{O}}\text{:} \\   \\ \text{N} \\ = \\ \text{:}\ddot{\text{O}}\text{:} \end{array} \right]^{-1}$	Bent	X	X
ClO <sub>3</sub> <sup>-1</sup>		$\left[ \begin{array}{c} \text{:}\ddot{\text{O}}\text{:} \\   \\ \text{Cl} \\   \\ \text{:}\ddot{\text{O}}\text{:} \\ / \quad \backslash \\ \text{:}\ddot{\text{O}}\text{:} \quad \text{:}\ddot{\text{O}}\text{:} \end{array} \right]^{-1}$	Trigonal pyramidal	X	X
SO <sub>4</sub> <sup>-2</sup>		$\left[ \begin{array}{c} \text{:}\ddot{\text{O}}\text{:} \\   \\ \text{S} \\   \\ \text{:}\ddot{\text{O}}\text{:} \\ / \quad \backslash \\ \text{:}\ddot{\text{O}}\text{:} \quad \text{:}\ddot{\text{O}}\text{:} \end{array} \right]^{-2}$	Tetrahedral	X	X