

VSPER Worksheet

for Intro Chem

	A	B	C	D	E	F	G	H	I	J	K	L
1	Compound	# Val. Elec.	Lewis Structure	# Lone Pairs	# Atoms bonded	# Charge Clouds	Charge Cloud Shape	Molecular Structure	Bond angle	Bond polar?	Molec. polar?	Resonance?
2	Ne [Element]	8	:Ne:	4	0	4	Tetrahedral	Not Applicable	NA	NA	NA	NA
3	HF	8	$\text{H}-\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{F}}}$	3	1	4	Tetrahedral	linear	180°	Y	Y	N
4	H ₂ O	8	$\text{H}-\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{O}}}-\text{H}$	2	2	4	Tetrahedral	bent or V-shaped	109.5°	Y	Y	N
5	NH ₃	8	$\begin{array}{c} \text{H}-\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{N}}}-\text{H} \\ \\ \text{H} \end{array}$	1	3	4	Tetrahedral	Pyramidal or Trigonal Pyramid	109.5°	Y	Y	N
6	CH ₄	8	$\begin{array}{c} \text{H}-\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{C}}}-\text{H} \\ \\ \text{H} \end{array}$	0	4	4	Tetrahedral	Tetrahedral	109.5°	N	N	N
7	CO ₂	16	$\text{:}\ddot{\text{O}}=\text{C}=\ddot{\text{O}}\text{:}$	0	2	2	linear	linear	180°	Y	N	N

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8												
9	BF_3	24	$\begin{array}{c} \text{:F:} \\ \text{:F}-\text{B}-\text{F:} \\ \text{:F:} \end{array}$	0	3	3	Trigonal planar	Trigonal planar	120°	Y	N	N
10	NH_4^+	8	$\left[\begin{array}{c} \text{H} \\ \text{H}-\text{N}-\text{H} \\ \text{H} \end{array} \right]^+$	0	4	4	Tetrahedral	Tetrahedral	109.5°	Y	Ion	N
11	SO_2	18	$\text{:}\ddot{\text{O}}\text{:}-\ddot{\text{S}}=\ddot{\text{O}}\text{:}$	1	2	3	Trigonal planar	bent or V-shaped	120°	Y	Y	Y
12	SCl_2	20	$\text{:}\ddot{\text{Cl}}\text{:}-\ddot{\text{S}}-\ddot{\text{Cl}}\text{:}$	2	2	4	Tetrahedral	bent or V-shaped	109.5°	Y	Y	N
13	H_3O^+	8	$\left[\begin{array}{c} \text{H} \\ \text{H}-\ddot{\text{O}}-\text{H} \\ \text{H} \end{array} \right]^+$	1	3	4	Tetrahedral	Pyramidal or Trigonal pyramidal	109.5°	Y	Ion	N
14	NO_3^-	24	$\left[\begin{array}{c} \text{:}\ddot{\text{O}}\text{:}-\text{N}=\ddot{\text{O}}\text{:} \\ \text{:}\ddot{\text{O}}\text{:} \end{array} \right]^-$	0	3	3	Trigonal planar	Trigonal planar	120°	Y	Ion	Y

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15											
H_2O_2 [HOOH]	14		2	2	4	Tetrahedral	bent or V-shaped	109.5° H-O? O-O? N	Y	Y	N
16											
H_2S	8		2	2	4	Tetrahedral	bent or V-shaped	109.5° N	Y	Y	N
17											
CO_3^{2-}	24		0	3	3	Trigonal planar	Trigonal planar	120°	Y	lon	Y
18											
CCl_4	32		0	4	4	Tetrahedral	Tetrahedral	109.5°	Y	N	N
19											
PCl_3	26		1	3	4	Tetrahedral	Pyramidal or Trigonal pyramidal	109.5°	Y	Y	N
20											
HCN	10		0	2	2	Linear	Linear	180°	N C-H C≡N	Y	N
21											

	A	B	C	D	E	F	G	H	I	J	K	L
22	Compound	# Val. Elec.	Lewis Structure	# Lone Pairs	# Atoms bonded	# Charge Clouds	Charge Cloud Shape	Molecular Structure	Bond angle	Bond polar?	Molec. polar?	Resonance?
23	C_2H_2 [HCCH]	10	$H-C \equiv C-H$	0	2	2	Linear	Linear	180°	N H-C? C-C? N	N N	N N

VSEPR = Valence Shell Electron Pair Repulsion