

Name: Key Date: _____ Period: _____

Chemical Bonding

How does chemical bonding determine molecule shape?

1. On your own...Read pp. 381-392
2. What is meant by the phrase "geometric structure"?

3. Describe the Valence Shell Electron-Pair Repulsion model:

4. Describe the following molecular structures:

- **Linear:**

atoms in molecule: 2 or 3

of bonds: 1-4

lone pairs: 0-2

Sketch of ball/stick model:



An example of a molecule with this structure is: CO_2 : $O=C=O$:

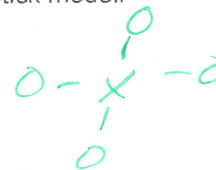
- **Tetrahedral:**

atoms in molecule: 4

of bonds: 4

lone pairs: 0

Sketch of ball/stick model:



An example of a molecule with this structure is: CH_4 - methane

Bent or V-

shaped:

atoms in molecule: 3

of bonds: 2-3

lone pairs: 1-2

Sketch of ball/stick model:



An example of a molecule with this structure is: H_2O



5. Draw Lewis Structures and predict the geometric structures of:

Compound or Ion	Name	Lewis Structure (circle any lone pairs)	Molecule Geometry Name	Draw shape
CCl ₄	carbon tetra chloride	$ \begin{array}{c} :\ddot{\text{Cl}}: \\ \\ :\ddot{\text{Cl}}-\text{C}-\ddot{\text{Cl}}: \\ \\ :\ddot{\text{Cl}}: \end{array} $	tetra hedral	
CO ₂	Carbon dioxide	$:\text{O}=\text{C}=\text{O}:$	linear	
PO ₄ ⁻³	phosphate ION	$ \left[\begin{array}{c} :\ddot{\text{O}}: \\ \\ :\ddot{\text{O}}-\text{P}-\ddot{\text{O}}: \\ \\ :\ddot{\text{O}}: \end{array} \right]^{-3} $	tetra hedral	same
H ₂ O	water	$\text{H}-\ddot{\text{O}}-\text{H}$	Bent	