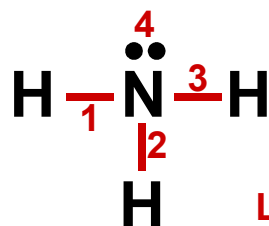


Valence Shell Electron Pair Repulsion (VSEPR)

1. Molecule



2. Lewis Dot Structure



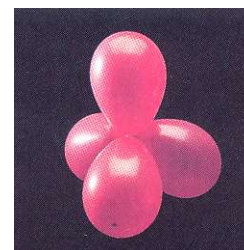
8 Valence e⁻

L.P. count
as one region!

3. # e⁻ regions*

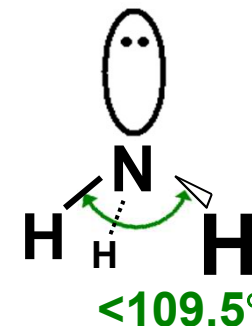
4

→ Tetrahedral



Four Balloons

4. Electron Geometry



5. Bond
Angles*
 107.3°

6. # Bonding
Regions*
3

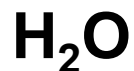
7. # Lone Pair
Regions*
1

8. Molecular
Geometry
Trigonal
Pyramidal 📢

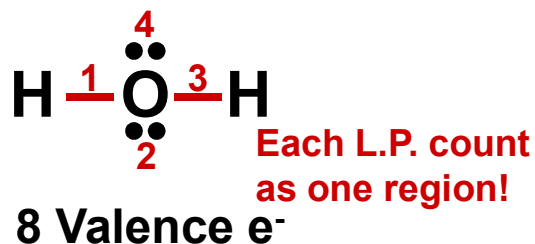
* around center atom

Valence Shell Electron Pair Repulsion (VSEPR)

1. Molecule



2. Lewis Dot Structure

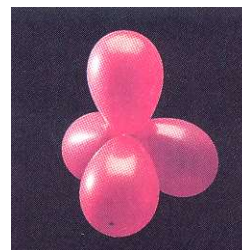


3. # e⁻ regions*

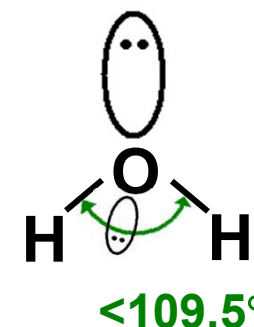
4

4. Electron Geometry

Tetrahedral



Four Balloons



5. Bond Angles*
~104.5°

6. # Bonding Regions*
2

7. # Lone Pair Regions*
2

8. Molecular Geometry
Bent
(Angular)

* around center atom

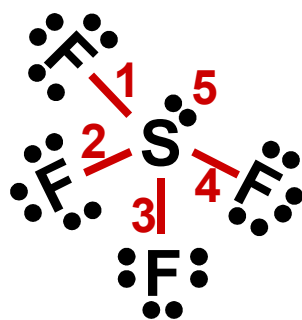


Valence Shell Electron Pair Repulsion (VSEPR)

1. Molecule



2. Lewis Dot Structure



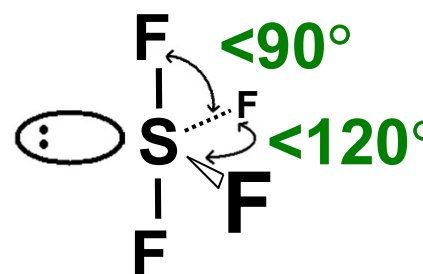
34
Valence e⁻

3. # e⁻ regions*

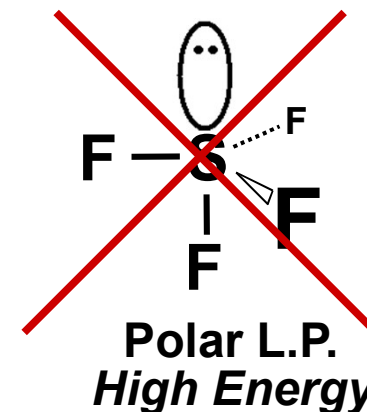
5

4. Electron Geometry

Trigonal Bipyramidal



Equatorial L.P.
Low Energy



Polar L.P.
High Energy

5. Bond Angles*

86.5° 101.4°

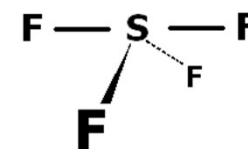
6. # Bonding Regions*

4

7. # Lone Pair Regions*

1

8. Molecular Geometry
SeeSaw



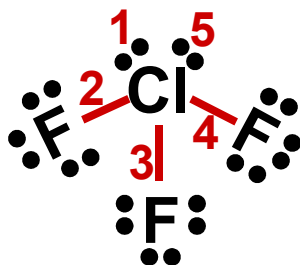
* around center atom

Valence Shell Electron Pair Repulsion (VSEPR)

1. Molecule



2. Lewis Dot Structure



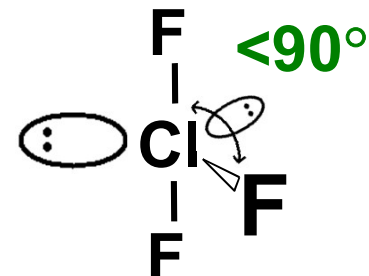
28
Valence e⁻

3. # e⁻ regions*

5

4. Electron Geometry

Trigonal Bipyramidal



Equatorial L.P.
Low Energy

5. Bond Angles*
87.5°

6. # Bonding Regions*
3

7. # Lone Pair Regions*
2

8. Molecular Geometry
"T" Shaped

* around center atom

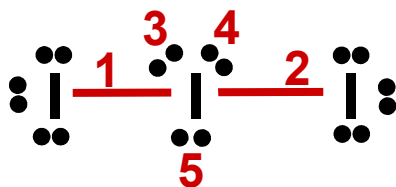


Valence Shell Electron Pair Repulsion (VSEPR)

1. Molecule



2. Lewis Dot Structure

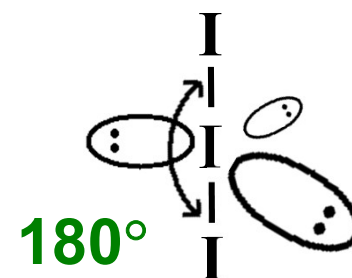


3. # e⁻ regions*

5

4. Electron Geometry

Trigonal Bipyramidal



Equatorial L.P.
Low Energy

5. Bond Angles*
180°

6. # Bonding Regions*
2

7. # Lone Pair Regions*
3

8. Molecular Geometry
Linear

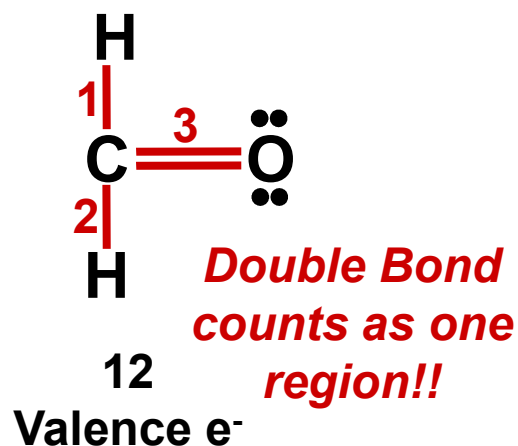
* around center atom



Valence Shell Electron Pair Repulsion (VSEPR)

1. Molecule
CH₂O
Formaldehyde

2. Lewis Dot Structure

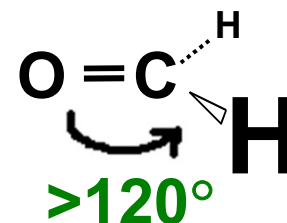


3. # e⁻ regions*

3

4. Electron Geometry

Trigonal Planar



5. Bond Angles*
122°

6. # Bonding Regions*
3

7. # Lone Pair Regions*
0

8. Molecular Geometry
Trigonal Planar

* around center atom



Memorize Figure 10.9 (pg. 382)

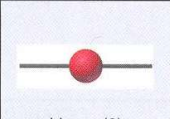
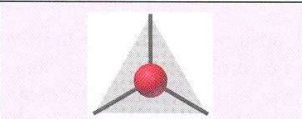
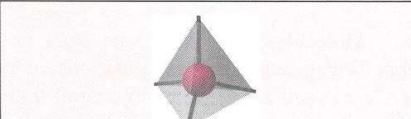
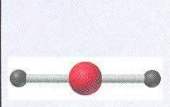
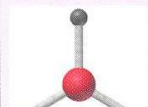

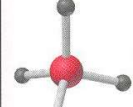


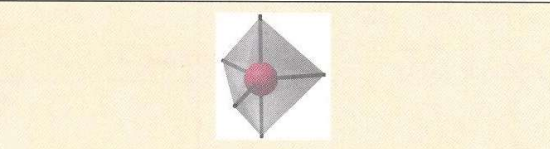
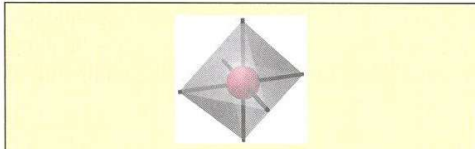
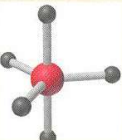
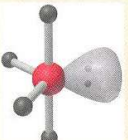
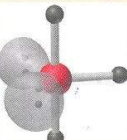
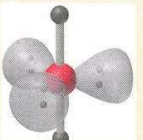
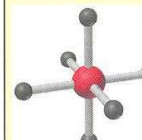
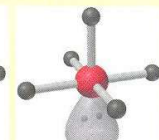
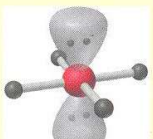
e ⁻ Group arrangement (no. of groups)	 <p>Linear (2)</p>		 <p>Trigonal planar (3)</p>		 <p>Tetrahedral (4)</p>		
Molecular shape (class)	 <p>Linear (AX₂)</p>		 <p>Trigonal planar (AX₃)</p>	 <p>V shaped or bent (AX₂E)</p>	 <p>Tetrahedral (AX₄)</p>	 <p>Trigonal pyramidal (AX₃E)</p>	 <p>V shaped or bent (AX₂E₂)</p>
No. of bonding groups	2		3	2	4	3	2
Bond angle	180°		120°	<120°	109.5°	<109.5°	<109.5°
e ⁻ Group arrangement (no. of groups)	 <p>Trigonal bipyramidal (5)</p>				 <p>Octahedral (6)</p>		
Molecular shape (class)	 <p>Trigonal bipyramidal (AX₅)</p>	 <p>Seesaw (AX₄E)</p>	 <p>T shaped (AX₃E₂)</p>	 <p>Linear (AX₂E₃)</p>	 <p>Octahedral (AX₆)</p>	 <p>Square pyramidal (AX₅E)</p>	 <p>Square planar (AX₄E₂)</p>
No. of bonding groups	5	4	3	2	6	5	4
Bond angle	90° (ax) 120° (eq)	<90° (ax) <120° (eq)	<90° (ax)	180°	90°	<90°	90°

Figure 10.9 A summary of common molecular shapes with two to six electron groups.

