

CHEMISTRY AT A GLANCE

The Geometry of Molecules

PREDICTING MOLECULAR GEOMETRY USING VSEPR THEORY

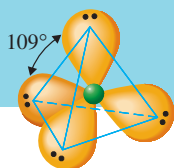
Operational rules

1. Draw a Lewis structure for the molecule.
2. Count the number of VSEPR electron groups about the central atom in the Lewis structure.
3. Assign a geometry based on minimizing repulsions between electron groups.

VSEPR ELECTRON GROUP ARRANGEMENTS

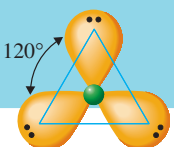
Tetrahedral

Occurs when four VSEPR electron groups are present about a central atom



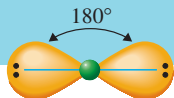
Trigonal Planar

Occurs when three VSEPR electron groups are present about a central atom



Linear

Occurs when two VSEPR electron groups are present about a central atom



MAKEUP OF VSEPR GROUPS

4 bonding

3 bonding

1 nonbonding

2 bonding

2 nonbonding

3 bonding

2 bonding

1 nonbonding

2 bonding

MOLECULAR GEOMETRY

Tetrahedral

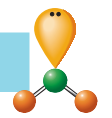
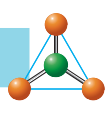
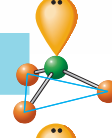
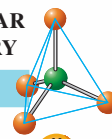
Trigonal pyramidal

Angular

Trigonal planar

Angular

Linear



The Chemistry at a Glance feature above summarizes the key concepts involved in using VSEPR theory to predict molecular geometry.

5.9 ELECTRONEGATIVITY

The ionic and covalent bonding models seem to represent two very distinct forms of bonding. Actually, the two models are closely related; they are the extremes of a broad continuum of bonding patterns. The close relationship between the two bonding models becomes