

TABLE 10.1 Electron and Molecular Geometries

Electron Groups*	Bonding Groups	Lone Pairs	Electron Geometry	Molecular Geometry	Approximate Bond Angles	Example
2	2	0	Linear	Linear	180°	$\text{O}=\text{C}=\text{O}$ <i>ends diff, not be polar</i>
3	3	0	Trigonal planar	Trigonal planar	120°	BF_3 <i>P/NP diff ends</i>
3	2	1	Trigonal planar	Bent	<120°	SO_2 <i>P</i>
4	4	0	Tetrahedral	Tetrahedral	109.5°	CH_4 <i>P/NP (symmetry)</i>
4	3	1	Tetrahedral	Trigonal pyramidal	<109.5°	NH_3 <i>P</i>
4	2	2	Tetrahedral	Bent	<109.5°	H_2O <i>P</i>
5	5	0	Trigonal bipyramidal	Trigonal bipyramidal	120° (equatorial) 90° (axial)	PF_5 <i>P/NP</i>
5	4	1	Trigonal bipyramidal	Seesaw	<120° (equatorial) <90° (axial)	SF_4 <i>P</i>
5	3	2	Trigonal bipyramidal	T-shaped	<90°	BrF_3 <i>P</i>
5	2	3	Trigonal bipyramidal	Linear NP	180°	XeF_2 <i>P</i>
6	6	0	Octahedral	Octahedral	90°	SF_6 <i>NP/P</i>
6	5	1	Octahedral	Square pyramidal	<90°	BrF_5 <i>P</i>
6	4	2	Octahedral	Square planar	90°	XeF_4 <i>P</i>

*Count only electron groups around the central atom. Each of the following is considered one electron group: a lone pair, a single bond, a double bond, a triple bond, or a single electron.

takes precedence over NP