

Electronic Geometry, Molecular Shape, and Hybridization

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The Valence Shell Electron Pair Repulsion Model (VSEPR Model)

The guiding principle: Bonded atoms and unshared pairs of electrons about a central atom are as far from one another as possible.

Bonded atoms	Nonbonded Pairs	Total	Electronic Geometry	Molecular Shape	Bond Angle	Hybridization
5	0	5	bipyramidal	bipyramidal	90&120°	sp³d
			Example: PCl ₅			
4	1	5	bipyramidal	'seesaw'	90&120°	sp³d
			Example: SF ₄			
3	2	5	bipyramidal	T-shape	90°	sp³d
			Example: ClF ₃			
2	3	5	bipyramidal	linear	180°	sp³d
			Example: XeF ₂ , I ₃ ⁻			
6	0	6	octahedral	octahedral	90°	sp³d²
			Example: SF ₆			
5	1	6	octahedral	square pyramidal	90°	sp³d²
			Example: BrF ₅			
4	2	6	octahedral	sq. planar	90°	sp³d²
			Examples: XeF ₄ , ICl ₄ ⁻			
3	3	6	octahedral	planar	90°	sp³d²
2	4	6	octahedral	linear	180°	sp³d²