Valence Shell Electron Pair Repulsion (VSEPR) Theory

*Geometry is determined around each central atom.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Electron Groups | Atoms Connected | Lone Pairs | Molecular Geometry | Bond Angles | Structure |
| 2 | 2 | 0 | linear | 180˚ |  |
| 3 | 3 | 0 | trigonal planar | 120˚ |  |
| 3 | 2 | 1 | bent | < 120˚ |  |
| 4 | 4 | 0 | tetrahedral | 109.5˚ |  |
| 4 | 3 | 1 | trigonal pyramidal | < 109.5˚ |  |
| 4 | 2 | 2 | bent | < 109.5˚ |  |

Electronegativity

*Measures the pull an atom exerts on the electron; based on a 4.0 scale.*

|  |  |  |
| --- | --- | --- |
| Electronegativity Difference | Bond Type | Example |
| Small (0.0-0.4) | pure covalent | O2 |
| Intermediate (0.5-2.0) | polar covalent | HF |
| Large (2.1+) | ionic | KBr |

