

Summary of Hybridization

| Number of Effective Pairs | Arrangement of Pairs | Hybridization Required |
|---------------------------|----------------------|------------------------|
| 2 | Linear | sp |
| 3 | Trigonal planar | sp^2 |
| 4 | Tetrahedral | sp^3 |
| 5 | Trigonal bipyramidal | dsp^3 |
| 6 | Octahedral | d^2sp^3 |

The diagram illustrates the relationship between the number of effective electron pairs, their arrangement, and the required hybridization. Each row includes a geometric arrangement, a hybridization label, and a 3D orbital model with bond angles.

- 2 Effective Pairs:** Linear arrangement. Hybridization: sp . Bond angle: 180° .
- 3 Effective Pairs:** Trigonal planar arrangement. Hybridization: sp^2 . Bond angle: 120° .
- 4 Effective Pairs:** Tetrahedral arrangement. Hybridization: sp^3 . Bond angle: 109.5° .
- 5 Effective Pairs:** Trigonal bipyramidal arrangement. Hybridization: dsp^3 . Bond angles: 90° and 120° .
- 6 Effective Pairs:** Octahedral arrangement. Hybridization: d^2sp^3 . Bond angle: 90° .