

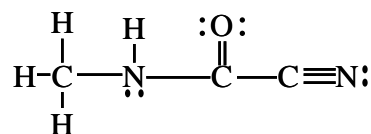
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ONE Electron Group (EG) [(or Electron Density Area) equals
ONE single bond
ONE double bond, NOT two EGs
ONE triple bond, NOT three EGs
ONE lone pair of electrons

EXAMPLE: What is the hybridization, if any, of each of the atoms in the following molecule?



First determine the Lewis Structure.



Next, count the number of Electron Groups (EGs) surrounding a particular atom. Hybridization, shape and bond angles around each atom can be determined by knowing the chart below (the last two columns are not really necessary):

Number of EGs (Electron Groups)	Hybridization	Number of p orbitals left over (unhybridized)	Ideal Bond Angles	Electron Group (EG) Geometry or "Family."	VSEPR notation (for the particular atom of interest)
2	sp	2	180°	linear	AX <sub>2</sub>
3	sp <sup>2</sup>	1	120°	trigonal planar	AX <sub>3</sub> , AX <sub>2</sub> E
4	sp <sup>3</sup>	0	109.5°	tetrahedral	AX <sub>4</sub> , AX <sub>3</sub> E, AX <sub>2</sub> E <sub>2</sub>
5	sp <sup>3</sup> d	0	90°, 120°, 180°	trigonal bipyramidal	AX <sub>5</sub> , AX <sub>4</sub> E, AX <sub>3</sub> E <sub>2</sub> , AX <sub>2</sub> E <sub>3</sub>
6	sp <sup>3</sup> d <sup>2</sup>	0	90°, 180°	octahedral	AX <sub>6</sub> , AX <sub>5</sub> E, AX <sub>4</sub> E <sub>2</sub>

ANSWER: Four EGs surround the first C on the left and four surround the N near the left, so they are sp<sup>3</sup> hybridized. Three EGs each surround the O and the next C, so they are sp<sup>2</sup> hybridized. Two EGs each surround the last C and N and so they are each sp hybridized.

