



Lewis Structure, VSEPR Theory and VB Hybridization

Determine the Lewis structure, VSEPR electronic geometry, VSEPR molecular geometry, Polarity, VB hybridization for the following molecules using **ONLY** your periodic table as a guide.

Molecule	Lewis Structure	Electronic Geometry	Molecular Geometry	Is the molecule polar?	What is the VB hybridization of the central atom(s)?
BF ₃		Trigonal Planar	Trigonal Planar	No	sp ²
CO ₂		Linear	Linear	No	sp
IF ₆		Octahedral	Octahedral	No	sp ³ d ²
SiF ₄		Tetrahedral	Tetrahedral	No	sp ³



SbCl_5		Trigonal bipyramid	Trigonal bipyramid	No	sp^3d
SeCl_4		Trigonal bipyramid	See-saw	Yes	sp^3d
ICl_4^-		Octahedral	Square planar	No	sp^3d^2
H_2O		Tetrahedral	Bent	Yes	sp^3
XeF_2		Trigonal bipyramid	Linear	No	sp^3d



SO_3^{2-}		Tetrahedral	Trigonal pyramid	Yes	sp^3
BrF_5		Octahedral	Square pyramid	Yes	sp^3d^2
ClF_3		Trigonal bipyramid	T-shaped	Yes	sp^3d
C_2H_4		Trigonal planar	Trigonal planar	No	sp^2
IF		Tetrahedral	Linear	Yes	sp^3

Are all five possible electronic geometries represented in this set of molecules? If not, which ones are missing? You can use the Electronic and Molecular Geometries Help Sheet posted on the website on the VSEPR page.

Yes

Are all fifteen possible molecular geometries represented in this set of molecules? If not, which ones are missing? You can use the Electronic and Molecular Geometries Help Sheet posted on the website on the VSEPR page.

No, EG trigonal planar with MG bent, EG octahedral with MG t-shaped, EG octahedral with MG linear are not represented in this set of molecules.

