

Answer on Question #48952 - Chemistry – Inorganic Chemistry

Question

Explain the structure of the following molecules on the basis of VSEPR theory: ClF_3 and PF_3 .

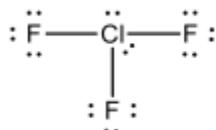
predict the geometry of the following molecules using the VSEPR model.

CO_2 , NH_3 , CH_4 , H_2O , SO_2 , NO_2 , ClF_3 , SF_6

Answer:

Valence shell electron pair repulsion (VSEPR) theory is a model used, in chemistry, to infer, from the number of electron pairs surrounding their central atoms, the geometry of individual molecules.

ClF_3 has five pairs of electrons around the central atom, two of which are lone pairs. Therefore the geometry is trigonal bipyramidal, but since there are two lone pairs of electrons, the molecule is T-shaped:



PF_3 has four pairs of electrons around the central atom, one of which is lone pair. The lone pair of electrons on the P atom leads to an unsymmetrical distribution of charge. The shape of the molecule is trigonal pyramidal:

