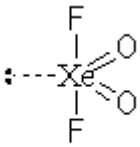
Question #75794, Chemistry / Inorganic Chemistry / Completed

Explain the structure of XeO2F2 and XeOF2 on basis of VSEPR theory

Answer:



XeO_2F_2

XeO2F2 is polar. It has 5 areas of electron density around the central Xe atom, one of which is a lone pair. Maximum separation for minimum repulsion means that the shape is based on a trigonal bipyramid structure, but is actually see-saw. The Xe=O bonds are polar, due to the greater electronegativity of O, and the Xe-F bonds even more polar, due to the F atom having the highest electronegativity on the periodic table. The molecule is not symmetrical, and so the dipole moments cannot cancel, making the molecule polar.

The central atom in XeOF2 is Xe. It carries 8 electrons. Out of which 3 bond pairs and 2 lone pairs (total 5 pairs) and hybridization will sp3d and basic structure is trygonal bipyramidal. But lone pair does not participate in geometry threrefore they are missing from 2 vertex of trigonal bipyramid give it a T-shape

$XeOF_2$