

Answer on Question #56718 - Chemistry - General Chemistry

Question:

Why H₂O is sp³ hybridization?

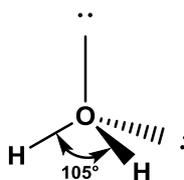
Solution.

To do hybridization of H₂O, we look for the central atom of Oxygen.

Oxygen contains 2 lone pairs of electrons + 2 sigma bonds with Hydrogen atom therefore it occupies 4 orbitals. When these 4 orbitals are formed they occupy 1s and 3p orbitals.

s	p _x	p _y	p _z
↑	↑	↑	↑

If the unshared electron pairs were simply left in *p* orbitals they would have to be located at 90 degrees to each other. That is a much higher energy requirement because of electron-electron repulsion than locating them at (approximately) 105 degrees, which is too close to angle of sp³ hybridization.



So water shows sp³ hybridization.

Answer: H₂O is sp³ hybridized