

Question#45028 – Chemistry – Other

Question:

The shape of a  $\text{PCl}_3$  molecule is described as

- A) bent
- B) trigonal planar
- C) linear
- D) trigonal pyramidal
- E) tetrahedral

Answer:

The P being the central atom, you put the Cl's around it, as well as 8 electrons around each Cl to satisfy the octet rule. 3 Cl atoms  $\times$  8 electrons around them only equal 24 electrons. you'd still have 2 electrons left to put in the Lewis structure

P is in the 3rd period so it has to have 8 electrons around it as well. with the P and each of the Cl sharing 2 electrons each, there are only 6 electrons around it, therefore you put the two leftover electrons on the P (calling the two electrons a lone pair) to satisfy the octet rule for that atom.

So, you have 3 attached atoms to a central atom + 1 lone pair. 4 regions, 3 shared = trigonal pyramidal.

