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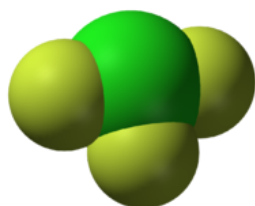
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In chemistry, **T-shaped molecular geometry** describes the structures of some molecules where a central atom has three [ligands](#). Ordinarily, three-coordinated compounds adopt [trigonal planar](#) or [pyramidal](#) geometries. Examples of T-shaped molecules are the halogen trifluorides, such as [ClF₃](#).^[1]



Structure of [chlorine trifluoride](#), an example of a compound with T-shaped coordination geometry.

According to [VSEPR theory](#), T-shaped geometry results when three ligands and two lone pairs of electrons are bonded to the central atom, written in [AXE notation](#) as AX₃E₂. The T-shaped geometry is related to the [trigonal bipyramidal molecular geometry](#) for AX₅ molecules with three equatorial and two axial ligands. In an AX₃E₂ molecule, the two lone pairs occupy two equatorial positions, and the three ligand atoms occupy the two axial positions as well as one equatorial position. The three atoms bond at 90° angles on one side of the central atom, producing the T shape.^[2]

The trifluoroxenate(II) anion, XeF₃⁻, has been investigated as a possible first example of an AX₃E₃ molecule, which might be expected by reasoning to have six electron pairs in an [octahedral](#) arrangement with both the three lone pairs and the three ligands in a [mer](#) or T-shaped orientations.^[3] Although this anion has been detected in the gas phase, attempts at synthesis in solution and experimental structure determination were unsuccessful. A [computational chemistry](#) study showed a distorted planar Y-shaped geometry with the smallest F–Xe–F bond angle equal to 69°, rather than 90° as in a T-shaped geometry.^[3]

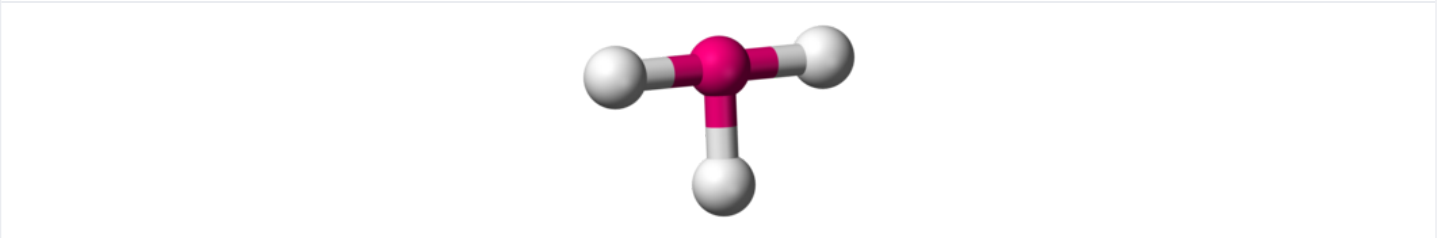
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T-shaped molecular geometry



Examples	ClF_3
Point group	C_{2v}
Coordination number	3
Bond angle(s)	$90^\circ, 180^\circ$
μ (Polarity)	>0

See also

AdChoices

- AXE method

References

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External links

- Chem| Chemistry, Structures, and 3D Molecules (<https://www.duhoctrungquoc.vn/wiki/url?site=http://www.3dchem.com/3D>)
- Indiana University Molecular Structure Center (<https://www.duhoctrungquoc.vn/wiki/url?site=http://web.archive.org/web/20011224193355/http://www.iumsc.indiana.edu/IUMSC/>)
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