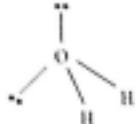




Valence shell configuration



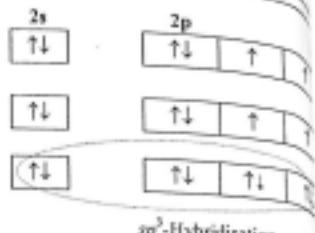
Ex.: N₂O, H₂S, SCl₂, NH₂

O atom in ground state

O atom in excited state

O atom in H₂O molecule

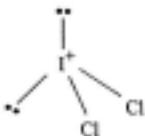
Angular or V-Shape



sp³-Hybridisation



Valence shell configuration



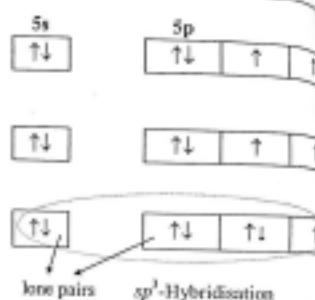
Ex.: BrF₂⁺, ClF₂⁺, IBe₂⁺, IF₂⁺, etc.

I⁺ in ground state

I⁺ in excited state

I⁺ in ICl₂⁺ ion

Angular or V-Shape



lone pairs sp³-Hybridisation



Valence shell configuration



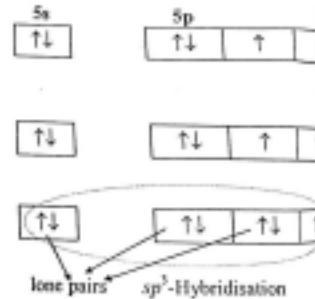
Ex.: BrF, ClF, IBr, IF, etc.

I in ground state

I in excited state

I in ICl ion

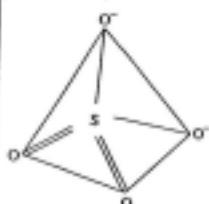
Linear Shape



lone pairs sp³-Hybridisation



Valence shell configuration



1s² 2s² 2p⁶ 3s² 3p⁴ 3d⁰

3s

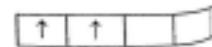
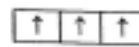
3p

3d

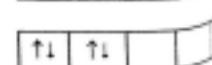
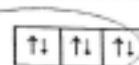
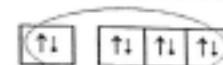
S atom in ground state



S atom in excited state



S atom in SO₄²⁻ ion



Tetrahedral Shape

4 σ bonds

sp³ Hybridisation

2 π bonds

ClO_4^- $\text{Cl}-\ddot{\text{O}}-\text{Cl}-\ddot{\text{O}}-\text{Cl}-\ddot{\text{O}}$ (E.C.)		$1s^2 2s^2 2p^6 3s^2 3p^6 3d^0$	3s	3p	3d
Valence shell configuration			$\uparrow\downarrow$	$\uparrow\downarrow \uparrow\downarrow \uparrow$	
	shell	Cl atom in ground state	$\uparrow\downarrow$	$\uparrow\downarrow \uparrow\downarrow \uparrow$	
		Cl atom in excited state	\uparrow	$\uparrow \uparrow \uparrow$	$\uparrow \uparrow \uparrow$
		Cl atom in ClO_4^- ion	$\uparrow\downarrow$	$\uparrow\downarrow \uparrow\downarrow \uparrow\downarrow$	$\uparrow\downarrow \uparrow\downarrow \uparrow\downarrow$
Tetrahedral Shape		4σ bonds		3π bonds	
		sp^3 Hybridisation			

CO_3^{2-} $\text{C}=\ddot{\text{O}}-\text{C}=\ddot{\text{O}}-\text{C}=\ddot{\text{O}}$ (E.C.)		$1s^2 2s^2 2p^6 3s^2 3p^2 3d^0$	2s	2p	
Valence shell configuration		Cl atom in ground state	$\uparrow\downarrow$	$\uparrow \uparrow$	
		Cl atom in excited state	\uparrow	$\uparrow \uparrow \uparrow$	
		Cl atom in CO_3^{2-} ion	$\uparrow\downarrow$	$\uparrow\downarrow \uparrow\downarrow$	$\uparrow\downarrow$
Trigonal planar shape		1π bond			
		sp^2 -Hybridisation			

4. sp^3d HYBRIDISATION

PCl_5 $\text{P}-\ddot{\text{Cl}}-\text{P}-\ddot{\text{Cl}}-\text{P}-\ddot{\text{Cl}}-\text{P}-\ddot{\text{Cl}}$ (E.C.)		$1s^2 2s^2 2p^6 3s^2 3p^3 3d^0$	3s	3p	3d
Valence shell configuration		P atom in ground state	$\uparrow\downarrow$	$\uparrow \uparrow \uparrow \uparrow$	
		P atom in excited state	\uparrow	$\uparrow \uparrow \uparrow \uparrow$	\uparrow
		P atom in PCl_5 molecule	$\uparrow\downarrow$	$\uparrow\downarrow \uparrow\downarrow \uparrow\downarrow$	$\uparrow\downarrow$
Trigonal bi pyramidal shape		5σ bonds			
Ex. : PF_5 , PCl_5 , AsF_5 , SbF_5 etc.		sp^3d Hybridisation			