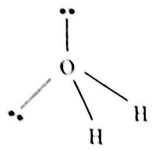
H_2O

$O \rightarrow (E.C.)\ 2s^2\ 2p^4$

Valence shell configuration

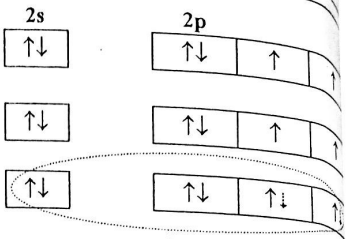


Ex : X_2O, H_2S, SCl_2, NH_2^-

O atom in ground state

O atom in excited state

O atom in H_2O molecule



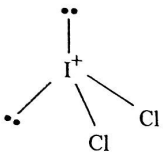
Angular or V-Shape

sp^3-Hybridisation

ICl_2^+

$I \rightarrow (E.C.)\ 5s^2\ 5p^5\ 5d^0$

Valence shell configuration

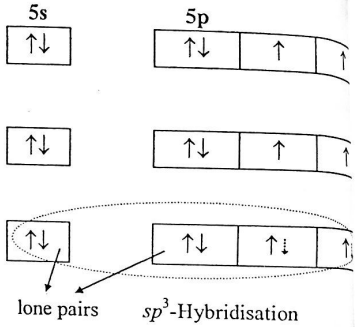


Ex.: BrF_2^+, ClF_2^+, IBr_2^+, IF_2^+, etc.

I^+ in ground state

I^+ in excited state

I^+ in ICl_2^+ ion



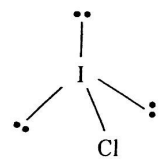
Angular or V-Shape

sp^3-Hybridisation

ICl

$I \rightarrow (E.C.)\ 5s^2\ 5p^5\ 5d^0$

Valence shell configuration

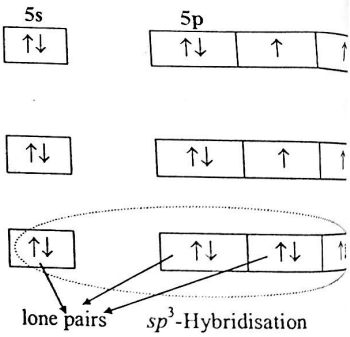


Ex.: BrF, ClF, IBr, IF, etc.

I in ground state

I in excited state

I in ICl ion



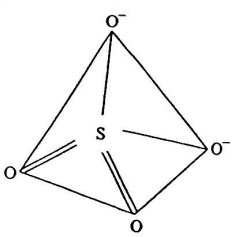
Linear Shape

sp^3-Hybridisation

SO_4^{2-}

$S \rightarrow (E.C.)$ $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^4\ 3d^0$

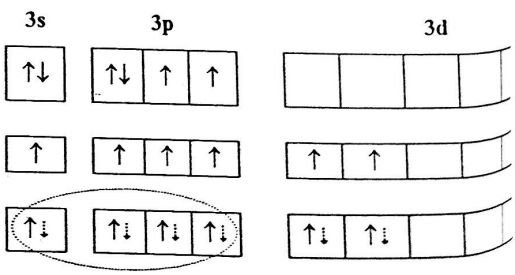
Valence shell configuration



S atom in ground state

S atom in excited state

S atom in SO_4^{2-} ion



4 σ bonds

2 π bonds

Tetrahedral Shape

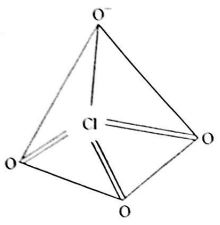
sp^3 Hybridisation

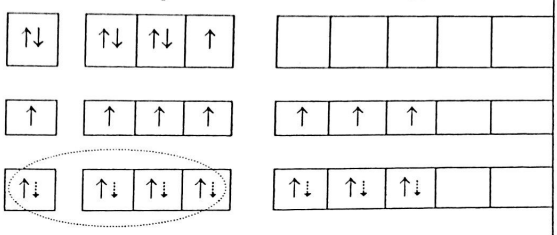
ClO_4^-

Cl → (2,8,7)

$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^5\ 3d^0$

Valence shell configuration



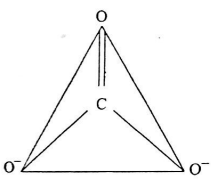


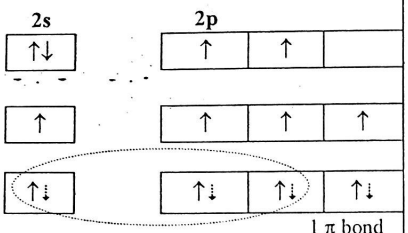
Tetrahedral Shape sp^3 Hybridisation

CO_3^{2-}

C → (2,4) 1s² 2s² 2p²

Valence shell configuration





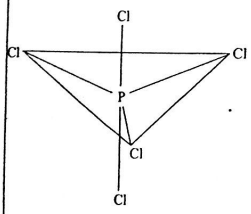
Trigonal planar shape sp^2-Hybridisation

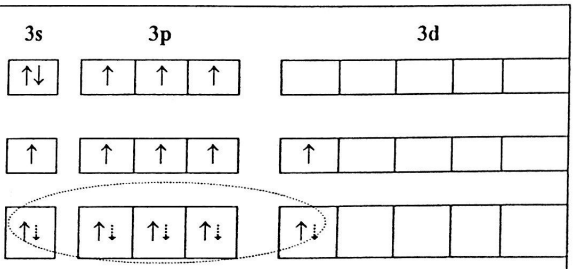
4. sp^3d HYBRIDISATION

PCl_5

P → (2,8,8,5) 3s² 3p³ 3d⁰

Valence shell configuration





Ex. : PF_5, PCl_5, AsF_5, SbF_5, etc.

Trigonal bi pyramidal shape

$sp^3\ d$ Hybridisation