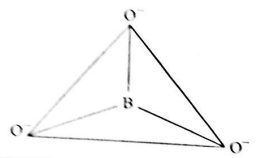
BO_3^{3-}

B → (E.C.) $1s^2\ 2s^2\ 2p^1$

Valence shell configuration



	2s	2p
B atom in ground state	↑↓	↑
B atom in excited state	↑	↑ ↑
B atom in BO_3^{3-} ion	↑↓	↑↓ ↑↓

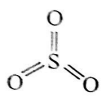
Trigonal Planar Shape

sp^2-Hybridisation

SO_3

S → (E.C.) $3s^2\ 2p^3\ 3d^1$

Valence shell configuration



	3s	3p	3d
S atom in ground state	↑↓	↑↓ ↑ ↑	
S atom in excited state	↑	↑ ↑ ↑	↑ ↑
S atom in molecule	↑↓	↑↓ ↑↓ ↑↓	↑↓ ↑↓

3 σ bonds

3 π bond

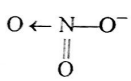
Trigonal Planar Shape

sp^2 Hybridisation

NO_3^-

N → (E.C.) $2s^2\ 2p^3$

Valence shell configuration



	2s	2p
N atom in ground state	↑↓	↑ ↑ ↑
N atom in excited state	↑↓	↑ ↑ ↑
N atom in NO_3^- ion	↑↓	↑↓ ↑↓ ↑↓

Dative bond — σ bonds — π bond

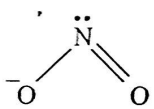
Trigonal Planar Shape

sp^2-Hybridisation

NO_2^-

N → (E.C.) $2s^2\ 2p^3$

Valence shell configuration



	2s	2p
N atom in ground state	↑↓	↑ ↑ ↑
N atom in excited state	↑↓	↑ ↑ ↑
N atom in NO_2^- ion	↑↓	↑↓ ↑↓ ↑↓

lone pair of electron — 2 σ bonds — 1 π bond

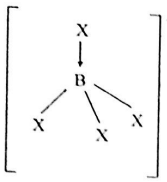
V- Shape

sp^2-Hybridisation

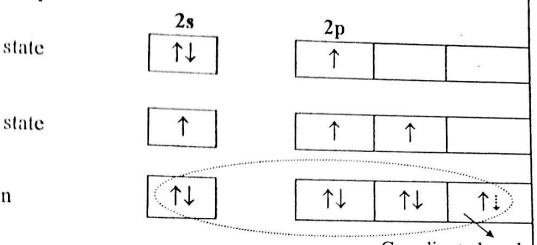
BX_4^- or $[X^- \rightarrow BX_3]$
X = Cl, Br, I, etc.

$_5B \rightarrow$ (E.C.) $1s^2\ 2s^2\ 2p^1$

Valence shell configuration



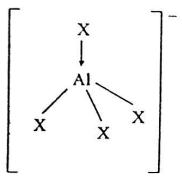
Tetrahedral Structure



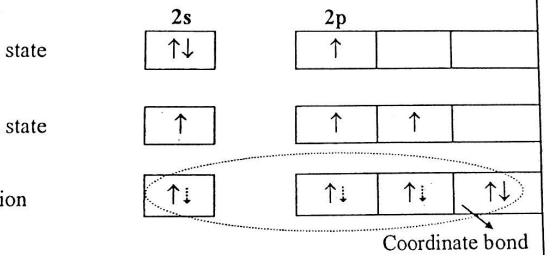
AlX_4^- or $[X^- \rightarrow AlX_3]$
X = Cl, Br, I, etc.

$_{13}Al \rightarrow$ (E.C.)
$1s^2 2s^2 2p^6 3s^2 3p^1$

Valence shell configuration



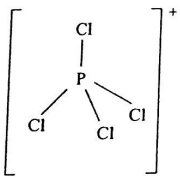
Tetrahedral Structure



PCl_4^+
X = H, R, etc.

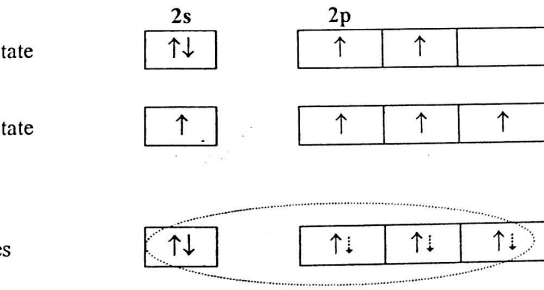
$P^+ \rightarrow$ (E.C.)
$1s^2 2s^2 2p^6 3s^2 3p^2$

Valence shell configuration



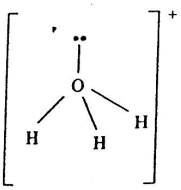
Tetrahedral Structure

Ex : SbF_4^+



H_3O^+ $[H_2O \rightarrow H^+]$
O $\rightarrow$ (E.C.) $1s^2\ 2s^2\ 2p^4$

Valence shell configuration



Ex : SeF_3^+, $Te(Me)_3^+$