VBT

Course on Chemical Bonding for Class XI 2023

Vishal joshi • Lesson 5 • Aug 21, 2021

Lewis acid :- lone pair accepting species are called lewis acid

type of lewis acid

(i) S-Block metal Cation) H^+

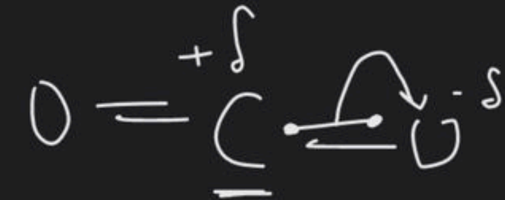
(ii) D Block metal Cation

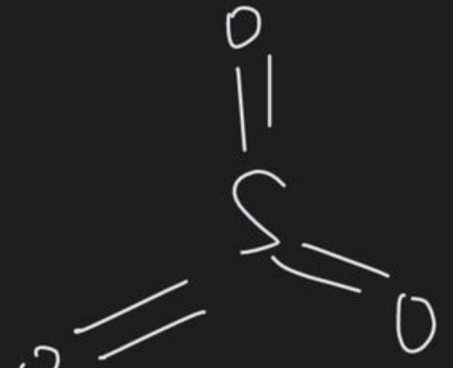
Cu^{+2}, Ag^+ Ni^{+2}

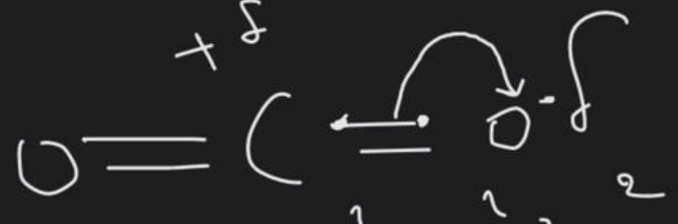
(iii) molecule in which vac. d- orbital is present

PCl_5 AsF_5

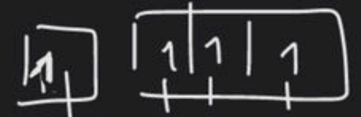
(iv) molecule in which more E.N element attached with multiple bond.



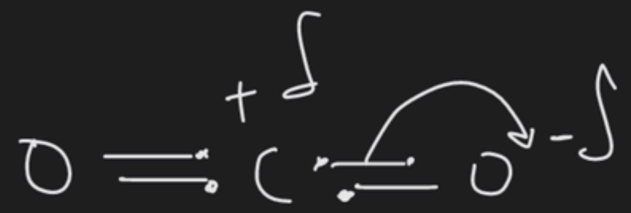




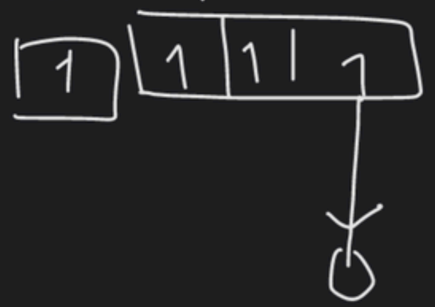
$1s^2 2s^2 2p^2$



N.A.

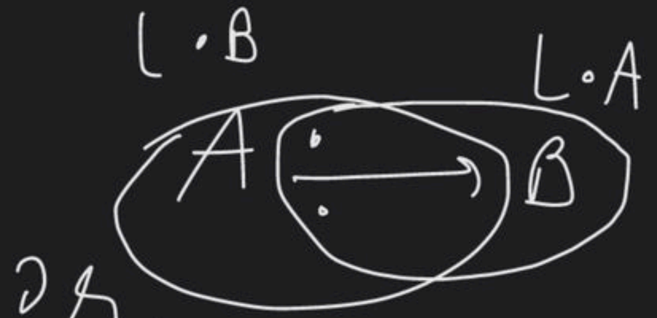


$C = 1s^2\ 2s^2\ 2p^2$



L.B = lone pair donating species

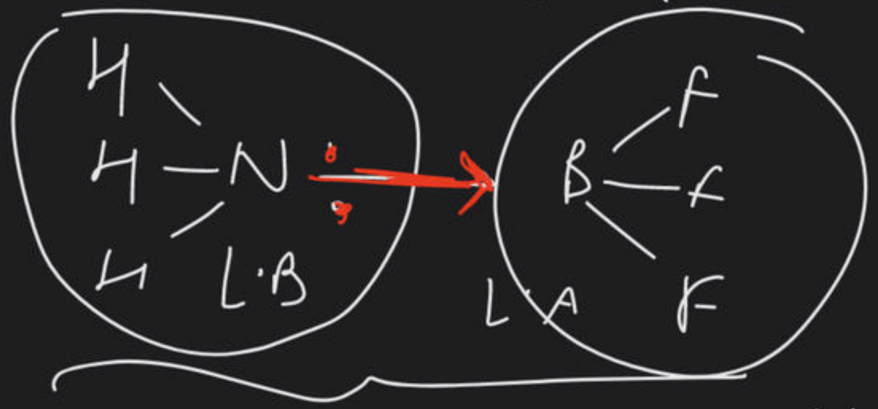
Co-ordinate bond :→ unequal sharing of e^-



$H_3N: \longrightarrow BF_3$

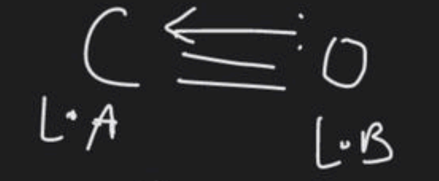
Classification

σ - Co-ordinate



Inter lewis acid base Interaction

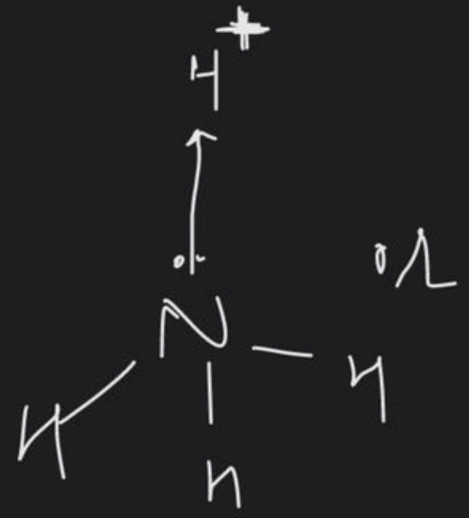
π - Co-ordinate

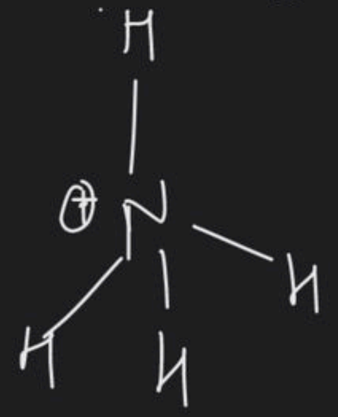


Intra lewis acid base

Maximum Covalency

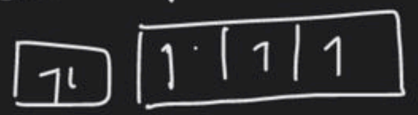
2	3	4	3	2	1	
Be	B	C	N	O	F	
2	3	4	5	6	7	
Mg	Al	Si	P	S	Cl	





3 5

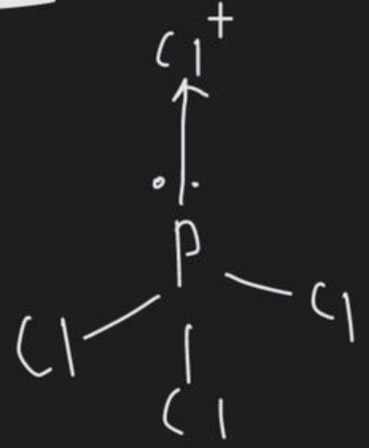
P = $3s^2$ $3p^3$ 3d

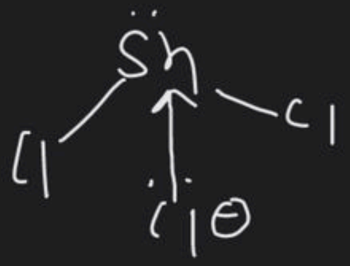


NH_4^+ PCl_6^- $[AsF_6]^-$ $[SiF_6]^{-2}$ $[BeCl_4]^{-2}$ BF_4^-

AlH_4^- PCl_4^+

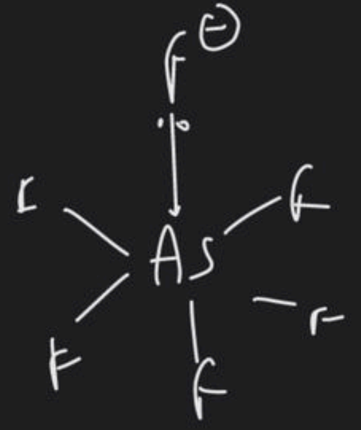
$SnCl_3^-$





PCl_6^-

AsF_6^-



Note :→ S Block element and N^{th} cation form Ionic bond.

except BeX_2

$X = FClBrI$

$MgX_2 | LiX | AlX_3$

$(X = Cl\ Br\ I)$

} Predom. Covalent

NaCl find the type of bond

1. Ionic
2. Covalent
3. Co-ordinate

$[PCl_6]^{\ominus}$

Covalent

Co-ordinate

KCN find the type of bond

(1) Ionic (2) Covalent

(3) Co-ordinate (4) 1 and 2

(5) all

K^{+} $\ominus$ CN

$\ominus$

$C \equiv N$

CaC_2

Ca^{+2} $\quad$ $^{\ominus}C \equiv C^{\ominus}$

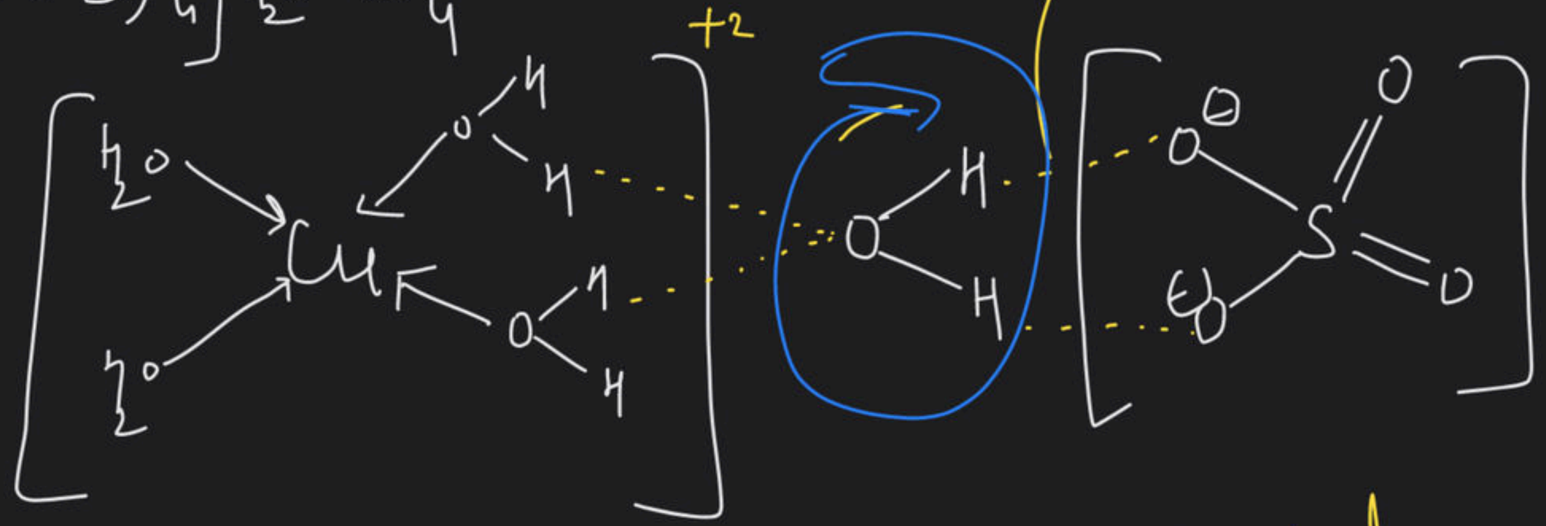
- Ionic

Covalent

$CuSO_4 \cdot 5H_2O$ (Blue vitriol)

or

$[Cu(H_2O)_4]H_2O \cdot SO_4$



Ionic, Covalent, Co-ordinate

π bond, Hydrogen bond

(1) find the number of Co-ordinate bond in Blue vitriol

(a) 3 (b) 6 (c) 4 (d) 2

And find the number of water molecules which bonded with only Hydrogen bond

(a) 2 (b) 3 (c) 1 (d) 4

$Cl = 1s^2 2s^2 2p^6 3s^2 3p^5$ 3d