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Chemical bonding

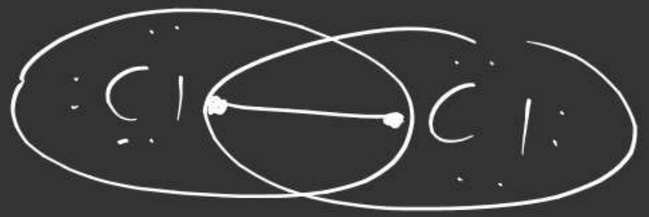
att. between two or more than two atoms in a molecule is called Chemical bonding

one Why Chemical bond form
to gain Stability

one How to gain Stability

(i) to Complete octet

(ii) lowering P.E



(Noble gases)

He $= 1s^2$

Ne, Ar, Kr, Xe, Rn $= 1s^2 2s^2 2p^6$ — 8

Na^+ 2, 8

$Cl^\ominus$ 2, 8, 8

XeF_2

XeF_4

XeF_6

XeO_3

$XeOF_4$

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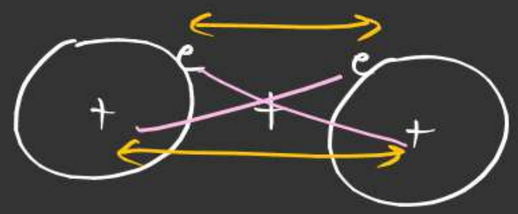
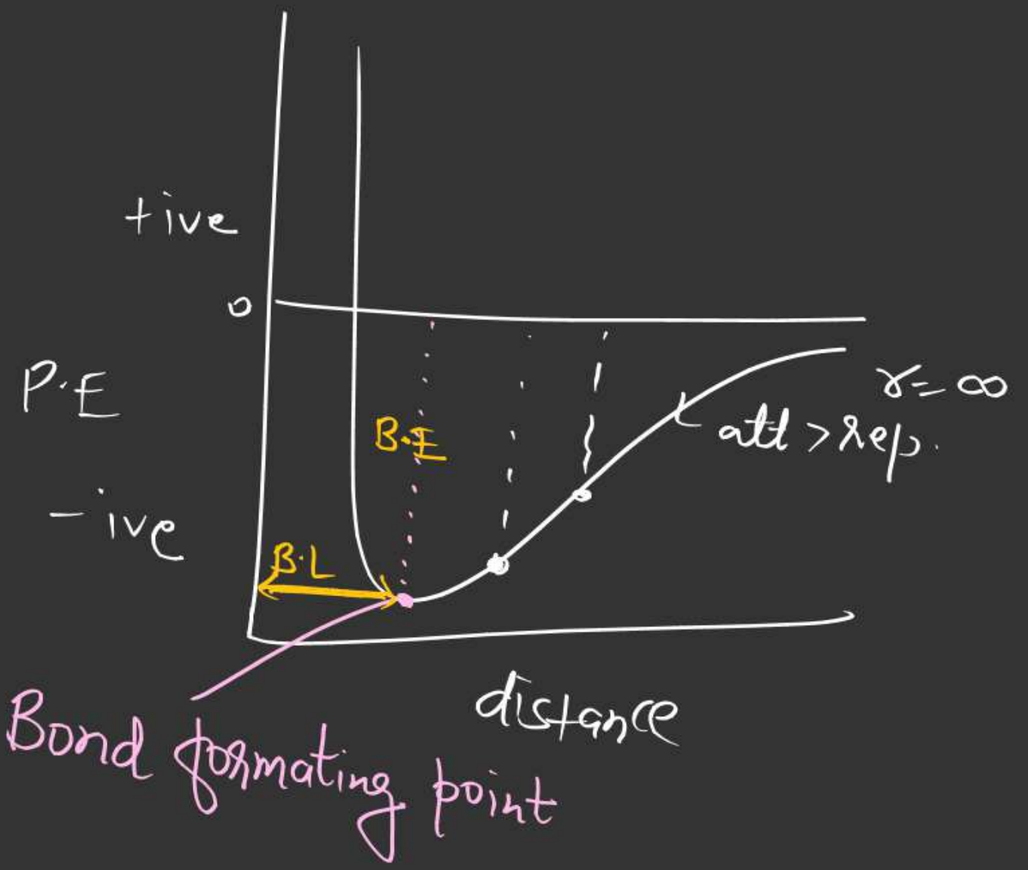


Release energy = -ive
absorbed energy = +ive



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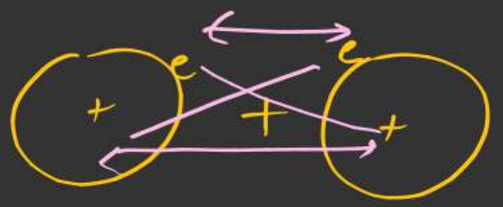

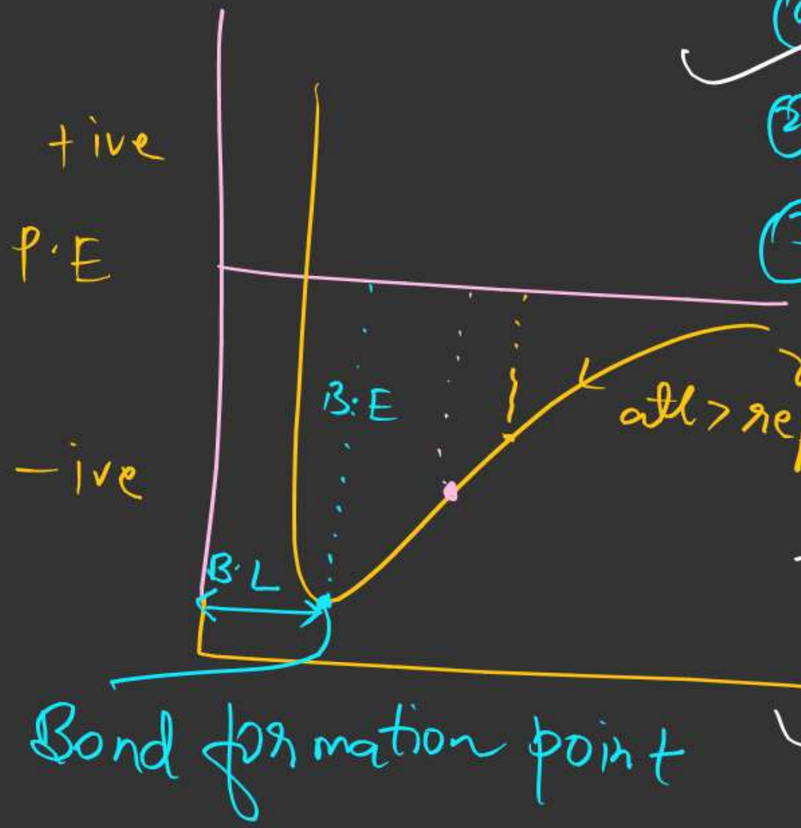

Que Bond formation is

(1) an exothermic process

(2) an endothermic process

(3) both

(4) none

Que Bond breaking is

(a) an exothermic

(b) an endothermic

(c) both

(d) none

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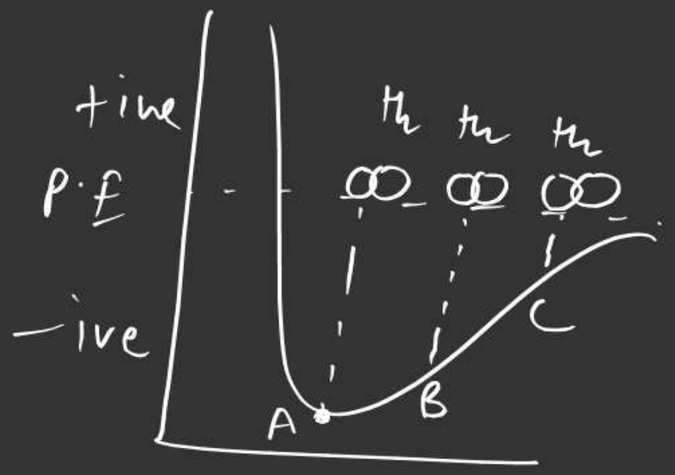
Ques



Ans Which of the point indicate formation of the molecule

(a) A (b) B (c) C (d) none

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Que Which of the following specie is more stable

(B) H_2 (D) $H^{\ominus}$ ($1s^2$) (C) H^{+} (a) none

Que Order of thermal stability

$HClO < HClO_2 < HClO_3 < HClO_4$

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Bartlett (1962)

$$O_2 + [PtF_6] \longrightarrow O_2^{+}[PtF_6]^{-}$$

Red colour
Ionic Compound

$[O_2 \simeq Xe]$

1175 KJ/mole

1170 KJ/mole

$$Xe + [PtF_6] \longrightarrow Xe^{+}[PtF_6]^{\ominus}$$

Red colour Ionic compound

first discoverd Noble gas Compound

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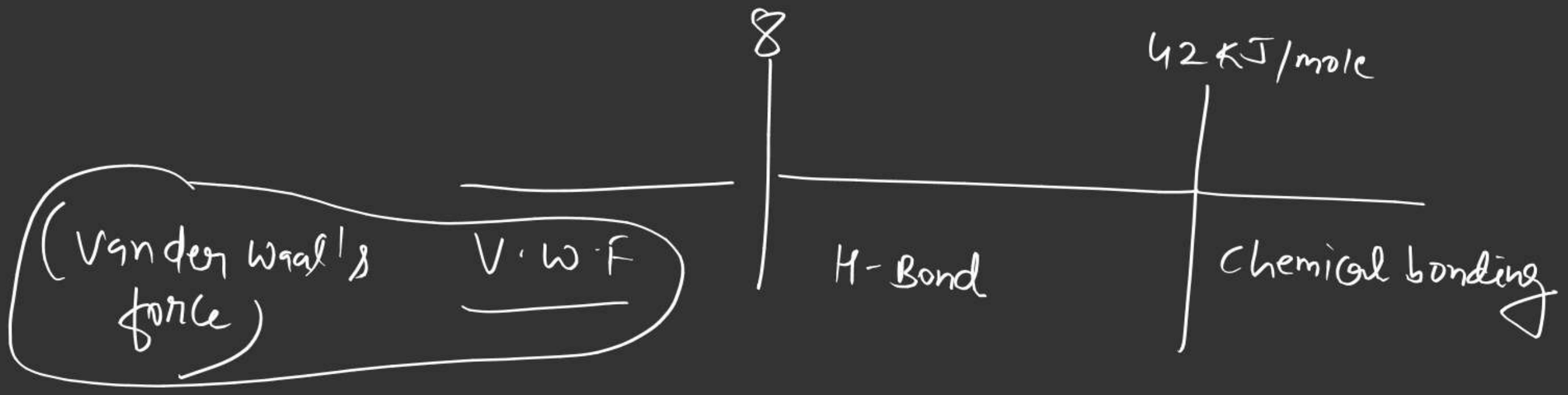

When amount of relese energy is greater than 42 KJ/mole then it is condsidered as chemical bonding.

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Classification of chemical bond.

- Strong bond
  - Ionic
  - Covalent
    - Simple Covalent (formed by equal sharing of e^-)
    - Co-ordinate (formed by unequal sharing of e^-)
  - metallic
- Weak bond
  - Hydrogen bond [formed by F, O, N] $\equiv$ C and sometimes Cl
  - dipole-dipole / dipole - Induced dipole / Instantaneous dipole - Induced dipole — V.W.F
  - Ion-dipole
  - Ion - Induced dipole

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Lewis dot Structure

n_1 = total number of valence e^- of all atom + (-ive) - (+ive)

n_2 = 2 × number of Hydrogen atom + 8 × all other atoms

$n_3 = n_2 - n_1$ = number of shared e^-

$\frac{n_3}{2}$ = number of bonds

$n_4 = n_1 - n_3$ = number of unshared e^-

$\frac{n_4}{2}$ = no of l.p (lone pair)

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$$\text{Formal Charge (f.c)} = V - \frac{S}{2} - U$$

V = valence e^-

S = Shared e^-

U = unshared e^- (8 − Shared e^-)

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	NO_2^-	NO_2^+	NH_4^+
$n_1 =$	$5+6\times2+1$	$5+6\times2-1$	$5+1\times4-1$
	$= 18$	16	8

total no of val-e⁻	2	3	4	5	6	7	8
	Be	B	C	N	O	F	Ne

① Select the Central atom (C.A)

② least E.N element act as central atom except H

③ -ive charge carried by more E.N
in case of oxygen and F, oxygen will carry.

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$COCl_2$

$n_1 = 4 + 6 + 7 \times 2$

$= 24$

$n_2 = (8 \times 4)$

$= 32$

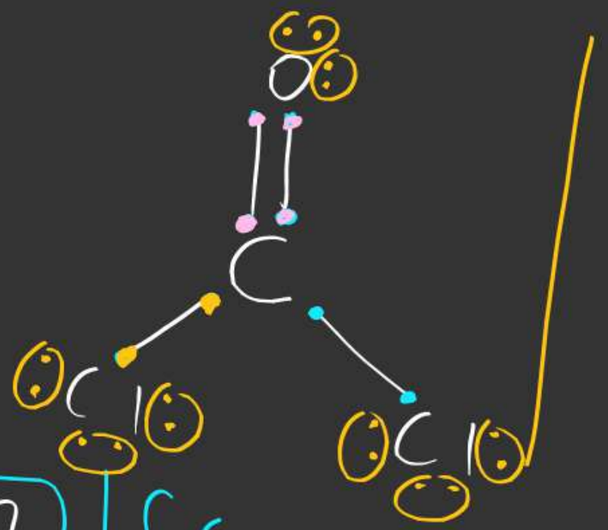
$n_3 = 32 - 24 = 8$

$\frac{8}{2} = 4$ [no of bonds]

$n_4 = 24 - 8 = 16$

$= 16$

$\frac{16}{2} = 8$ (no of l.p)



f.c on C $= V - \frac{S}{2} - U$

$= 4 - \frac{8}{2} - 0$

$= 0$

f.c on oxygen $= 6 - \frac{4}{2} - 4$

$= 0$

f.c on Cl $= 7 - \frac{2}{2} - 6$

$= 0$

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NO_2^-

NO_3^-

O_3

NH_4^+