Solubility order :-

(i) Small anion ⇒ Factor ⇒ L.E.

Solubility $\propto \frac{1}{L.E}$

(ii) Larger anion ⇒ factor ⇒ H.E.

Solubility $\propto$ H.E.

Exception :-

Alkali metal Cabonate (L.E. की factor dekhna है)

(Li_2CO_3, Na_2CO_3 - - - -)

Alkali metal bicarbonate [— " —]

$LiHCO_3$, $NaHCO_3$ - - -

BeF_2 ⇒ H.E. की factor dekhna है

Ques. Compare Solubility in following.

(1) $LiF < NaF < KF < RbF < CsF$

{ L.E ∝ Charge / Size.

↓ Solubility ∝ $\frac{1}{L.E\uparrow}$

Size↑ L.E↓ Solubility↑

(2) $BeSO_4 > MgSO_4 > CaSO_4 > SrSO_4 > BaSO_4$

SO_4^{2-} → large anion Solubility ∝ H.E

(3) $LiClO_4 > NaClO_4 > KClO_4 > RbClO_4 > CsClO_4$

ClO_4^- → large → H.E.

(4) $BeCO_3 > MgCO_3 > CaCO_3 > SrCO_3 > BaCO_3$

CO_3^{2-} → large anion ⇒ H.E.

(5) $MgF_2 < CaF_2 < SrF_2 < BaF_2 < BeF_2$

(6) $Li_2CO_3 < Na_2CO_3 < K_2CO_3 < Rb_2CO_3 < Cs_2CO_3$

CO_3^{2-} → large anion ⇒ L.E.

General points of Solubility :-

(1) All the salts of NH_4^+ ion and alkali metals are soluble except -

LiF, Li_2PO_4, Li_2CO_3, $Li_2C_2O_4$

(2) All the NO_3^-, ClO_4^-, CH_3COO^- are soluble.

(3) Sulphide (S^{2-}) of NH_4^+ ion, alkali metals and alkaline earth metals are soluble

rest are insoluble

Hg^{2+} (HgS), Pb^{2+}, Cu^{2+}, Cd^{2+}, Bi^{3+}

Hongi | Punjabi kudiya Sidhi bindali.

(4) Sulphates of all elements are soluble

except –

Hg Ag Ba Ca Pb Sr

ਏ ਬੀ ਸੀ ਡੀ ਈ ਐਫ ਜੀ ਐਚ ਆਈ ਜੇ ਕੇ

(5) OH^- of NH_4^+, alkali metals $Ba(OH)_2$, $Ca(OH)_2$, $Sr(OH)_2$ are soluble rest are insoluble.

(6) Halides are generally soluble

Except :- $AgCl$ $AgBr$ AgI PbI_2

White ppt | Pale yellow ppt | Yellow ppt | Yellow ppt

(7) Generally Chlorides (Cl^-) are soluble

Except - Ag^+, Hg_2^{2+}, Pb^{2+}

अपवाद — चाँदी, पारा, सीसा

melting points of ionic compounds :-

⇒ S-block ⇒ L.E.↑ m.P.↑

Exception, Li, Be

∝↑ Covalent↑ m.P.↓
Char.

⇒ Comparision of S & d-block metal ion

d-block ⇒ ∝↑ m.P.↓

Ques. Compare m.p. of following –

low m.p. → max m.p.

(i) LiCl NaCl KCl RbCl CsCl

$NaCl > KCl > RbCl > CsCl > LiCl$

(ii) $NaCl > CuCl$

(iii) $SnCl_2 > SnCl_y$ (the Sn in $SnCl_2$ is Sn^{2+}; the Sn in $SnCl_y$ is Sn^{+y})

Hydrogen bonding :-

(1) The hydrogen bonding is shown by those Covalent Compound in which hydroge is ditectly Attached with more E.N. elements like F, O, N etc

(2) In some cases Cl & C also exhibit H- bonding

(3) It is weak intermolecular and intramolecular forces.

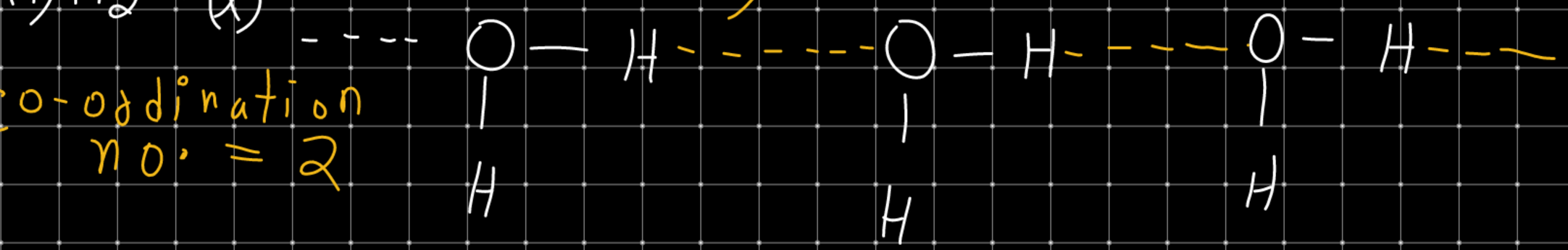
(4) The energy released during H-bonding is like- b/w 8 kj/mol to 42 kj/mol

Types of H- Bonding-

(1) Inter molecular H-bonding

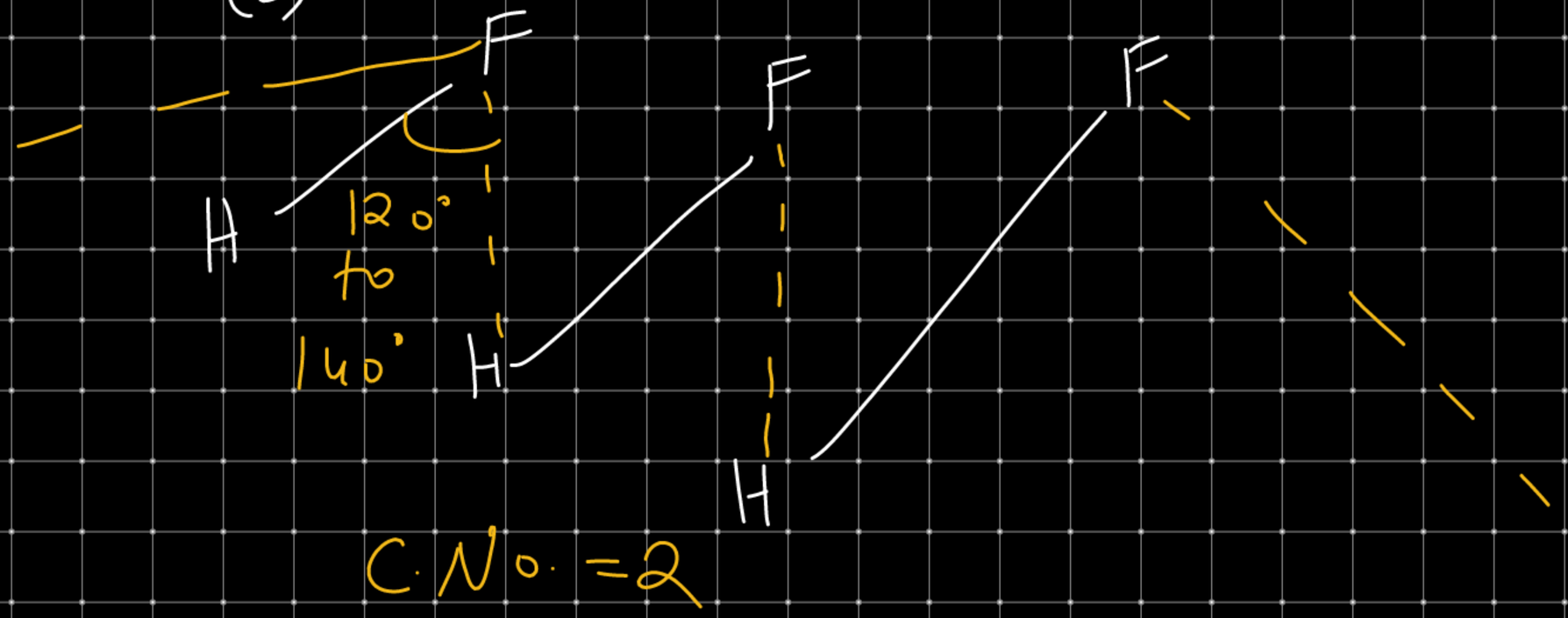
Whenever H-bonding is formed by two same or different species then it is called inter molecular H-bonding.

Ex :- (i) $H_2O_{(l)}$



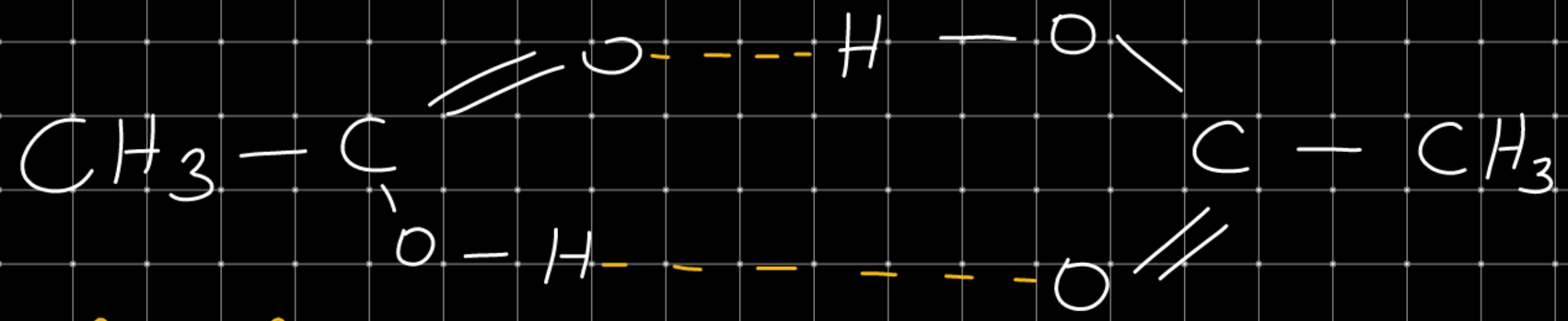
Co-ordination no. = 2

(2) $HF_{(s)}$

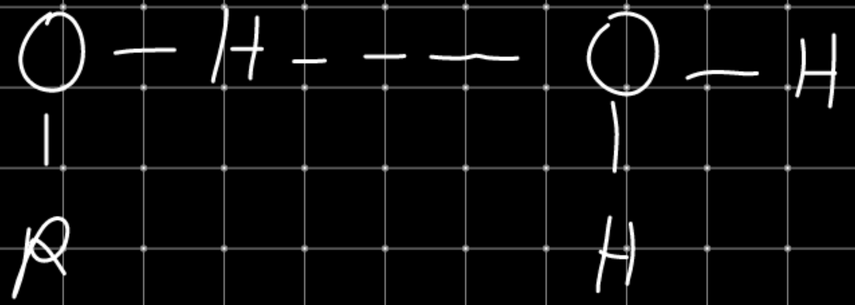


C.No. = 2

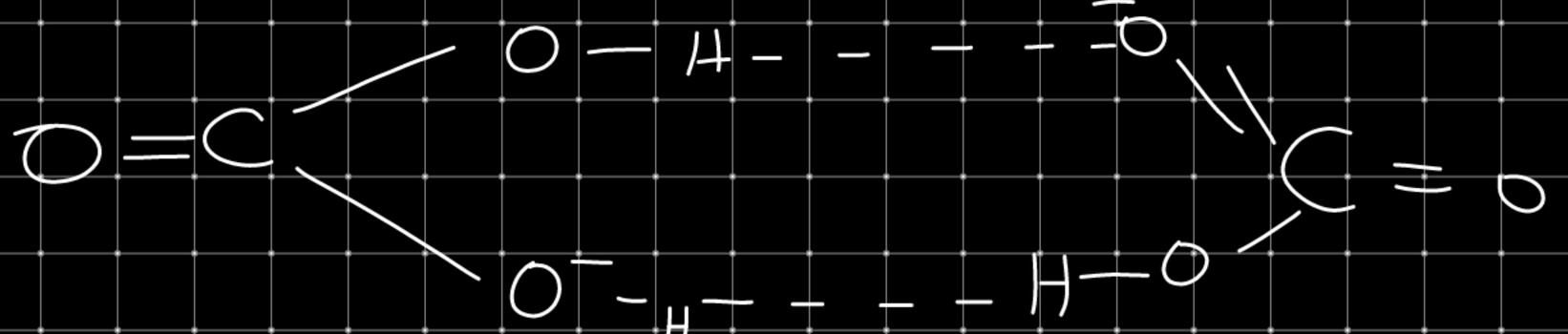
(3) CH_3COOH in vapour phase (dimer)



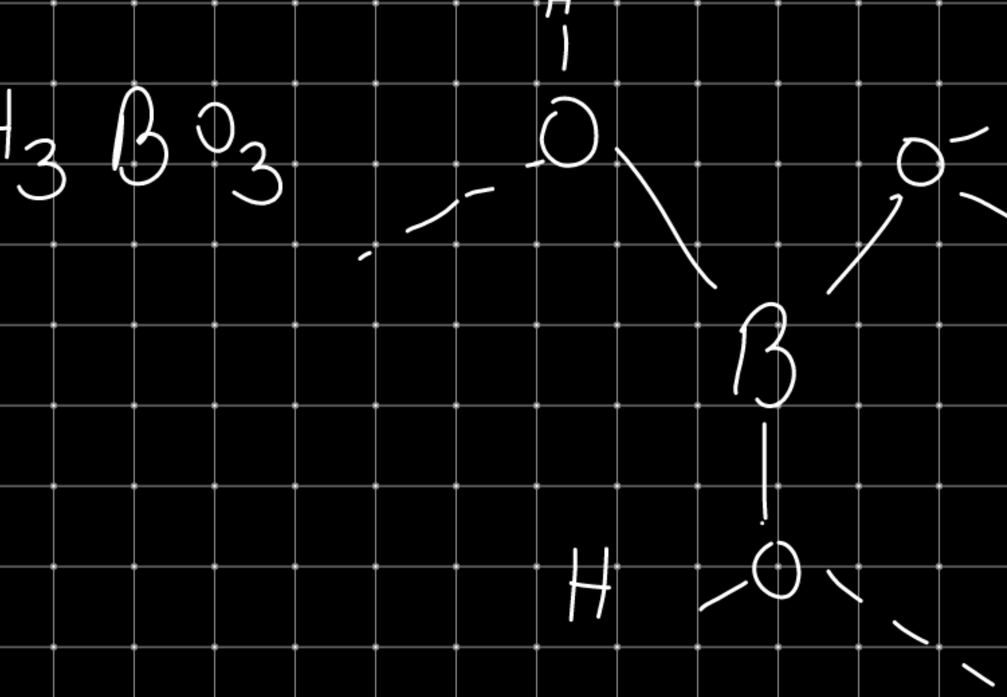
(4) Alcohol in water ⇌



(5) $K^+HCO_3^-$ (dimer)

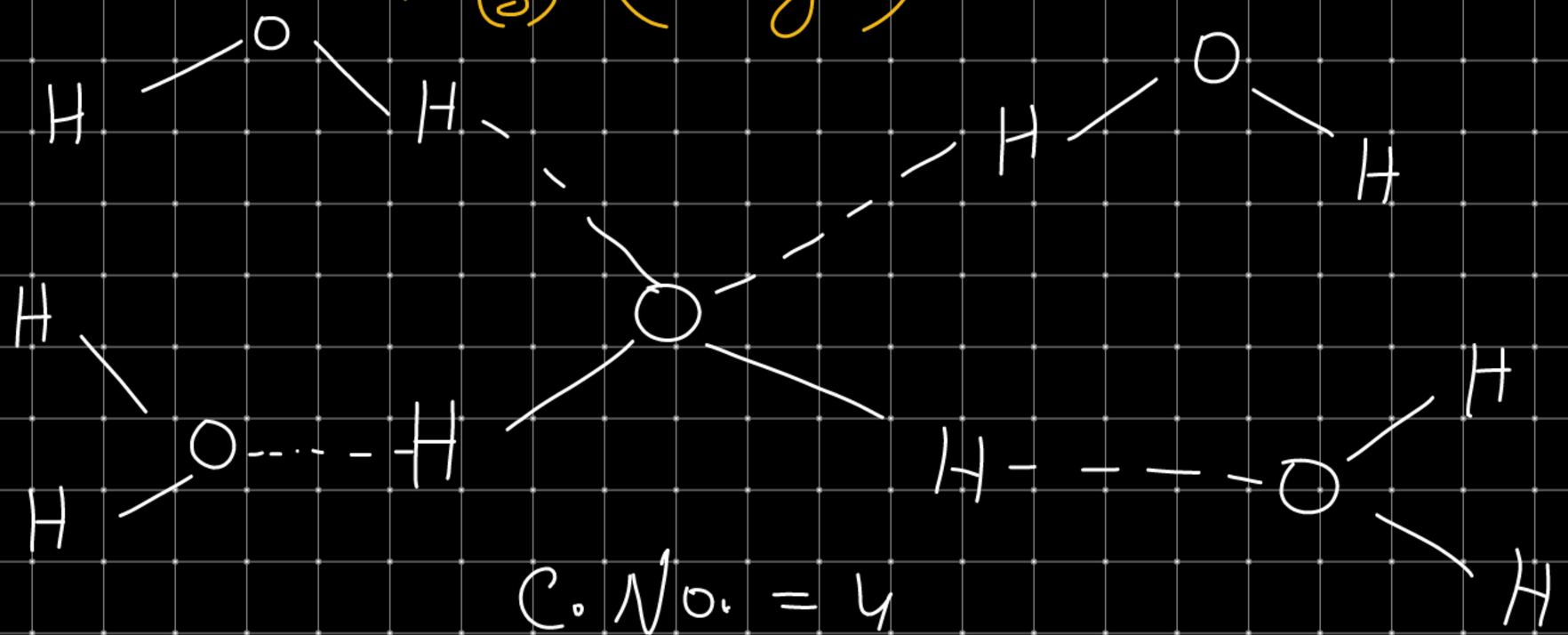


(6) H_3BO_3



layered structure

(7) Ice $H_2O_{(s)}$ (cage)



C.No. = 4

density of $H_2O_{(s)} < H_2O_{(l)}$

Volume $H_2O_{(l)} < H_2O_{(s)}$

(2) Intramolecular H-bonding :-

When H-bonding is exist within a molecule then it is called intra molecular H-bonding

ex(i) O-Nitro phenol :-

6 member ring

Chelate

When 5-member or 6-member ring.