

Application of E.N

① Bond length and Bond strength

B.L



B.S

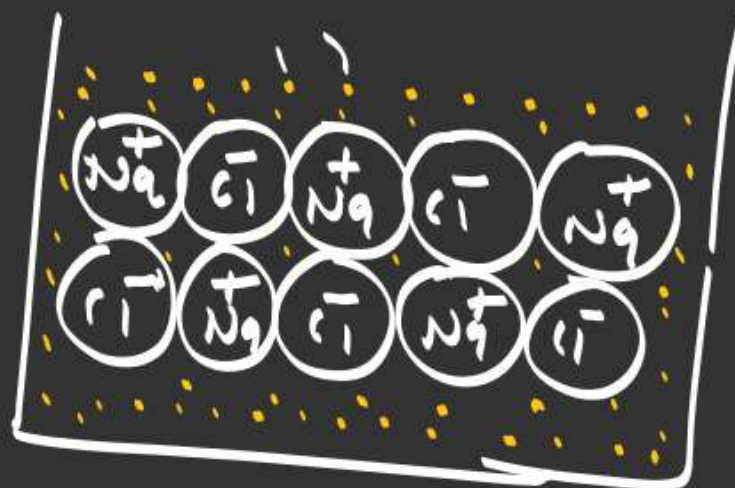
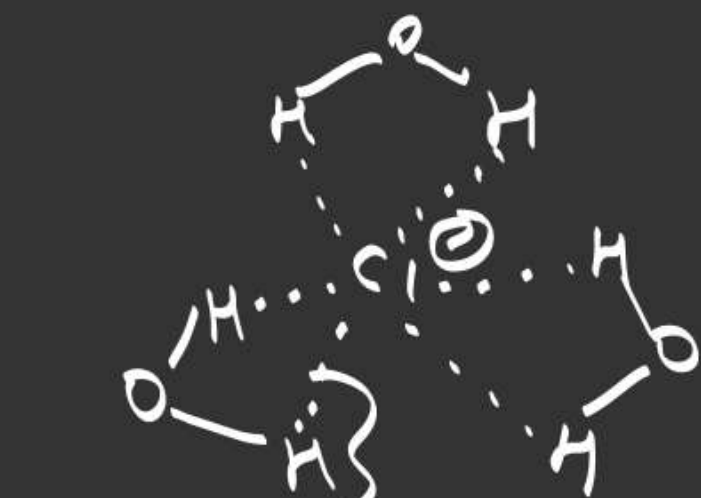
② % of Ionic ch.

Henry Smith

$$\% \text{ of Ionic ch.} = 16\Delta + 3.5\Delta^2$$

$$\Delta = \text{e.n diff.}$$

Solubility

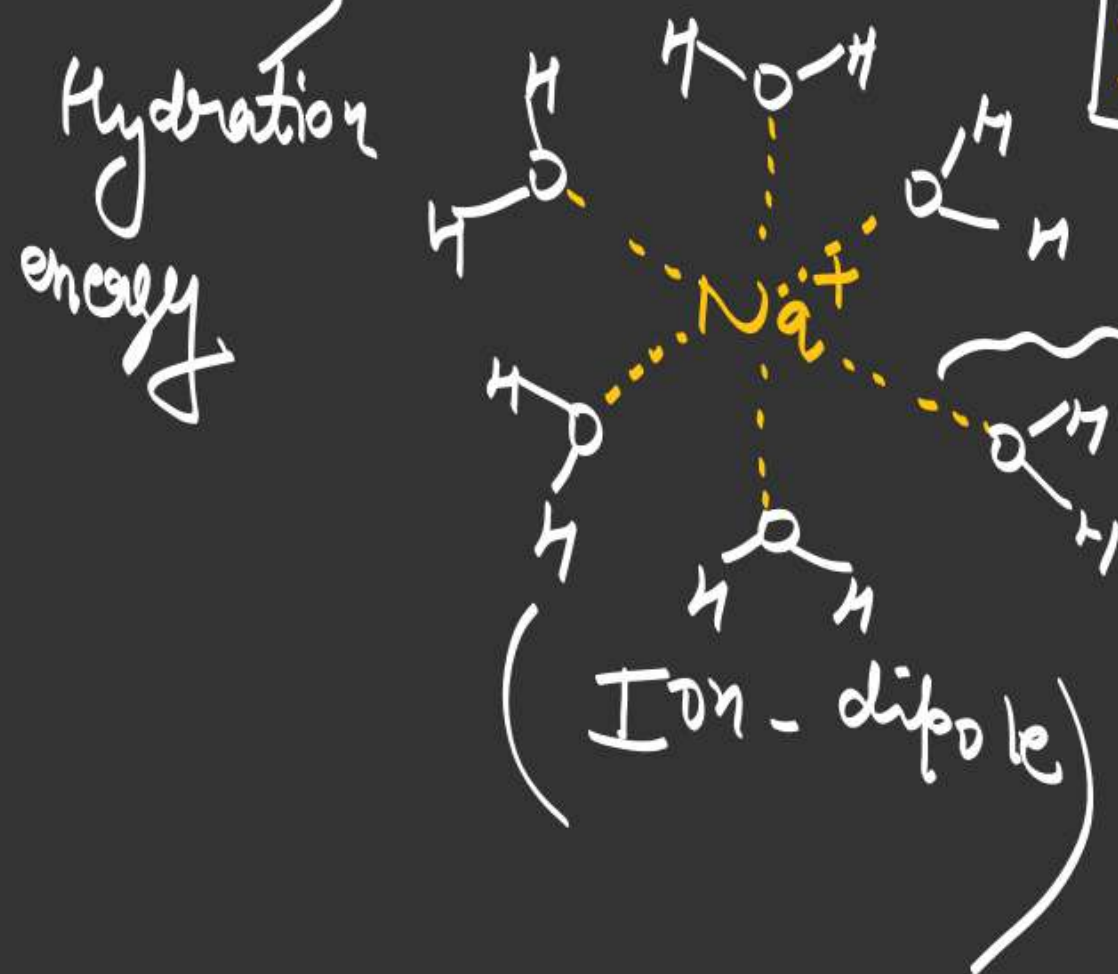


$$f_{air} = \frac{K q_1 q_2}{r^2}$$



$$f_{air} = \frac{1}{4\pi\epsilon_0} \frac{q_1 q_2}{r^2}$$

$$f_{water} = \frac{1}{4\pi\epsilon_0 \cdot 80} \frac{q_1 q_2}{r^2}$$



hydration energy

$$f_{water} = \frac{f_{air}}{80}$$

if

$$\underline{H.E > L.E}$$

then Ionic compound
Soluble

$$H.E < L.E$$

then Ionic compound
Insoluble

$$\underline{H.E = L.E}$$

Lattice energy $L.E \Rightarrow$ amount of released energy when one mole of Ionic Compound is formed.

$$L.E \propto \text{Charge}$$

$$L.E \propto \frac{1}{\text{size}}$$

$$L.E = \frac{K q_1 q_2}{r}$$

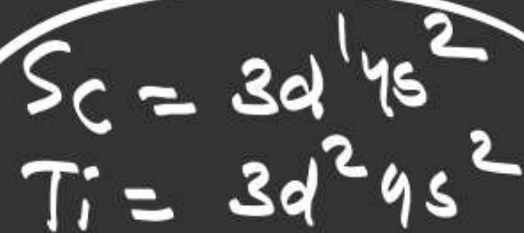
$q_1 =$ charge on cation

$q_2 =$ charge on anion

$$r = (r_c + r_a)$$

$r_c =$ radius of cation

$r_a =$ radius of anion



order of L.E

$L.E \propto \text{Charge}$

$L.E \propto \frac{1}{\text{Size}}$

F^-

O^{2-}

N^{3-}



Li

Na

K

Rb

Cs



down
the group
size ↑

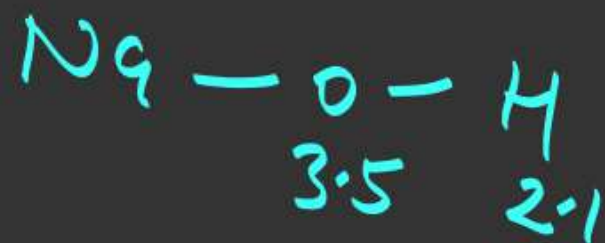
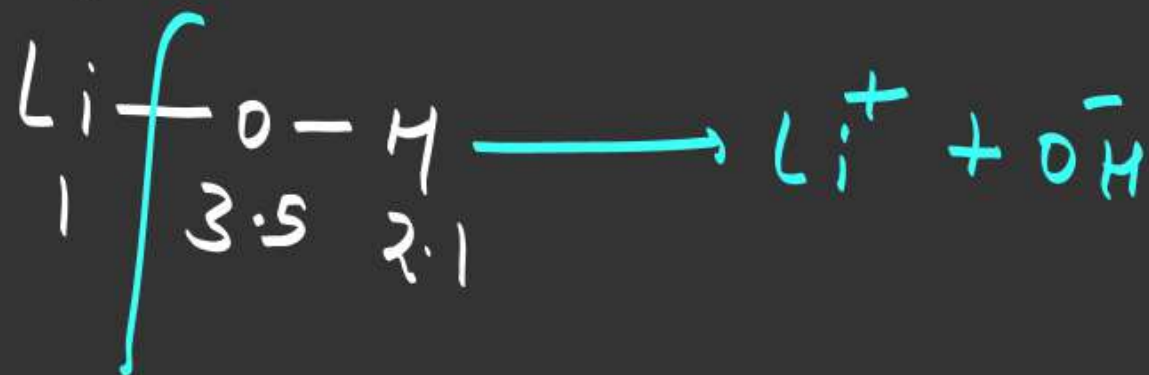
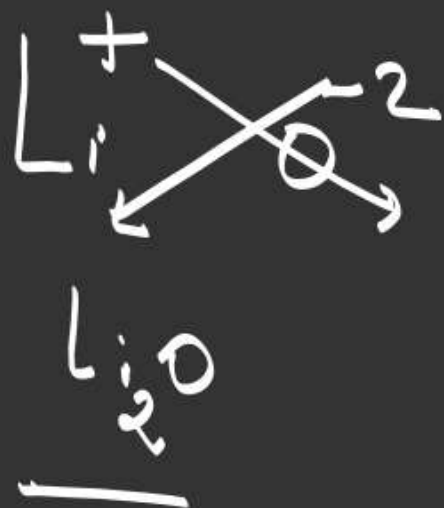
F
Cl
Br
I

Hydration energy \Rightarrow amount of released energy
When one of Ionic compound
dissolve in polar solvent

then it is called solvation energy

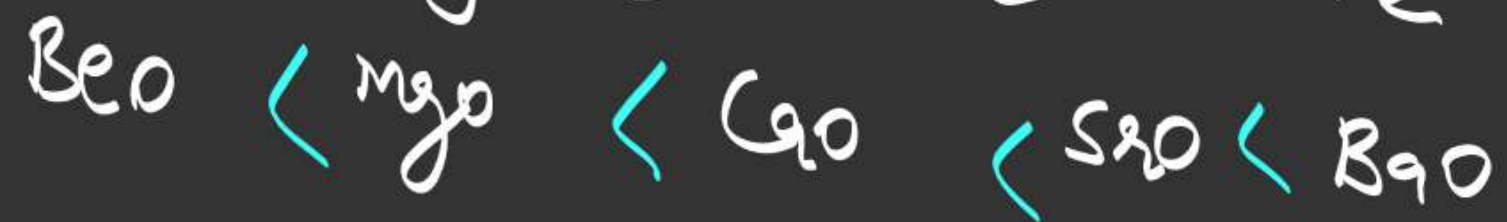
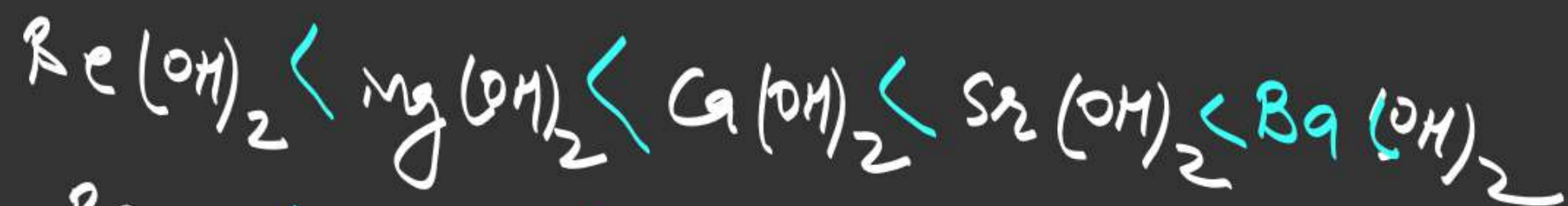
If water is taken as polar solvent then it is called
Hydration energy

dissolution of ionic compound



H^+ donor = acid
 OH^- donor = base

Order of basic character



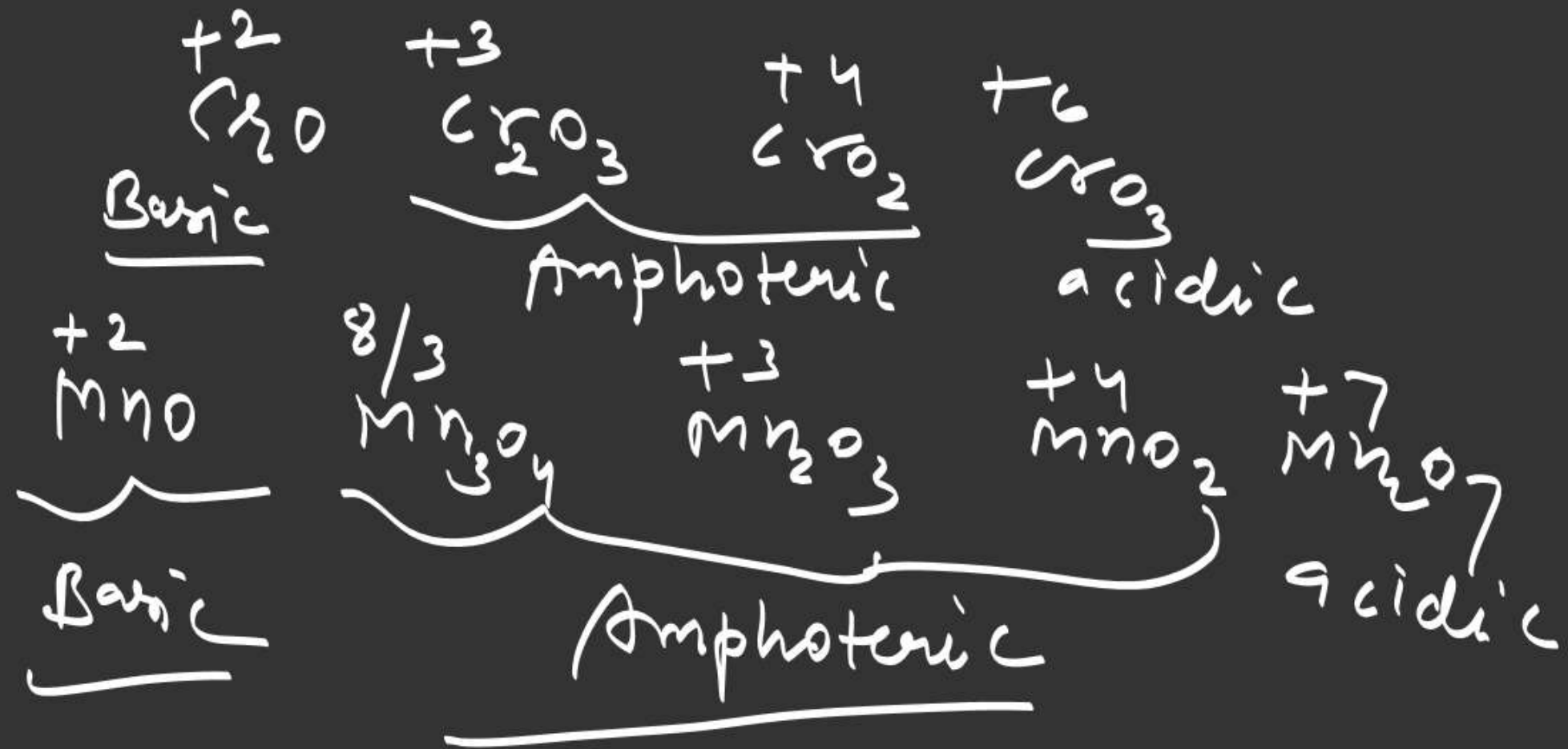
Note \Rightarrow s-Block oxides are
Basic in nature
except BeO [Amphoteric]

पं जा बे अली गाना मुनाउयो कार में
Pb Zn Be Al Ga Sn (H^{+3})

all the oxides and hydroxides are
Amphoteric in nature

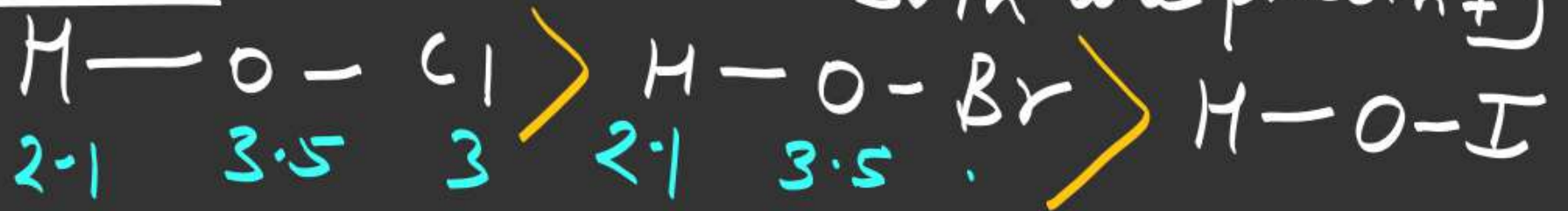
As_2O_3 Sb_2O_5 V_2O_5

Note \Rightarrow $\underbrace{\text{NO, CO, N}_2\text{O, H}_2\text{O}}_{\text{neutral oxide}}$



[oxyacid \Rightarrow acid in which oxygen and hydrogen both are present]

dissolution
acidic order



Note →

2.1 H
Li Be B C N O F
1 1.5 2 2.5 3 3.5 4
C
3 1

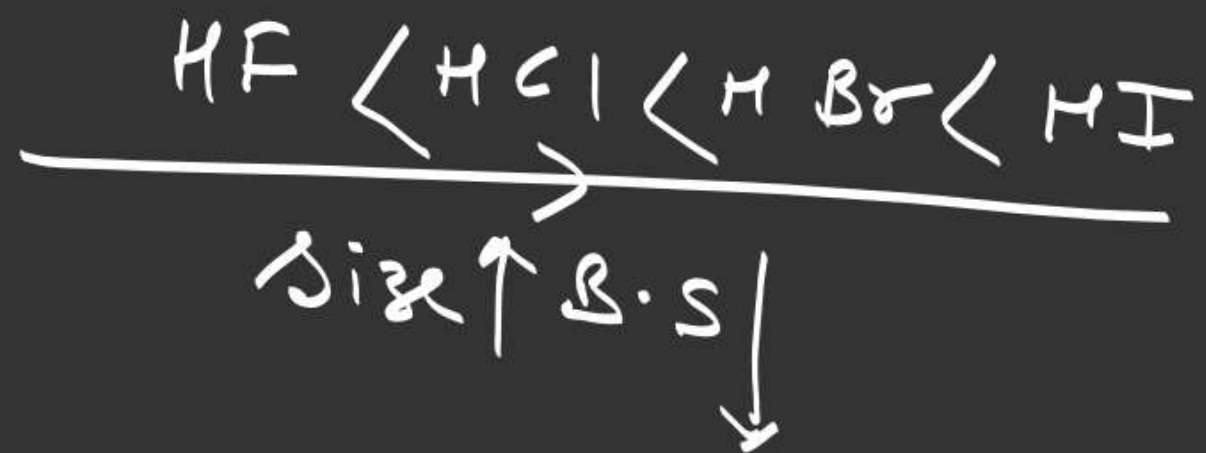
Concept does not apply

Note \Rightarrow this concept does not apply for hydron acid (HF, HCl, HBr, HI)

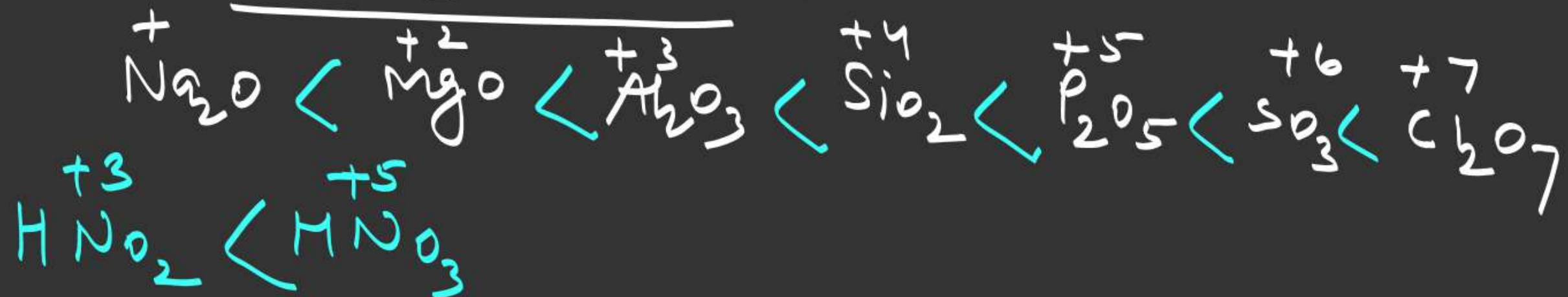
F
 Cl
 Br
 I

down the group

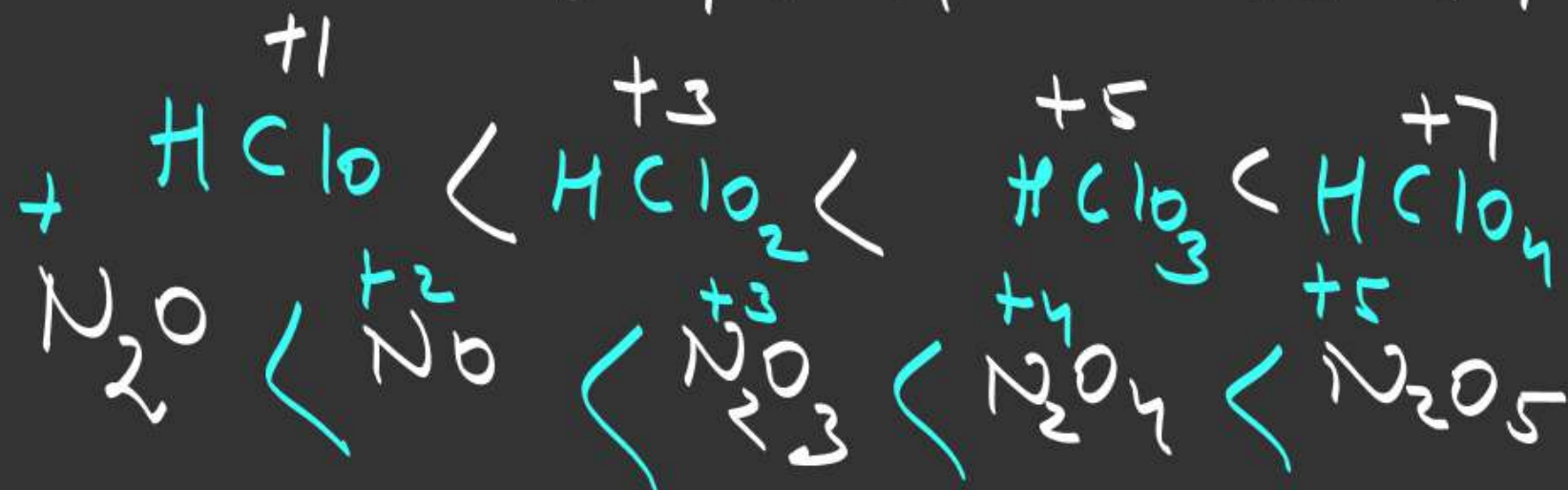
$\text{C-N} \downarrow$

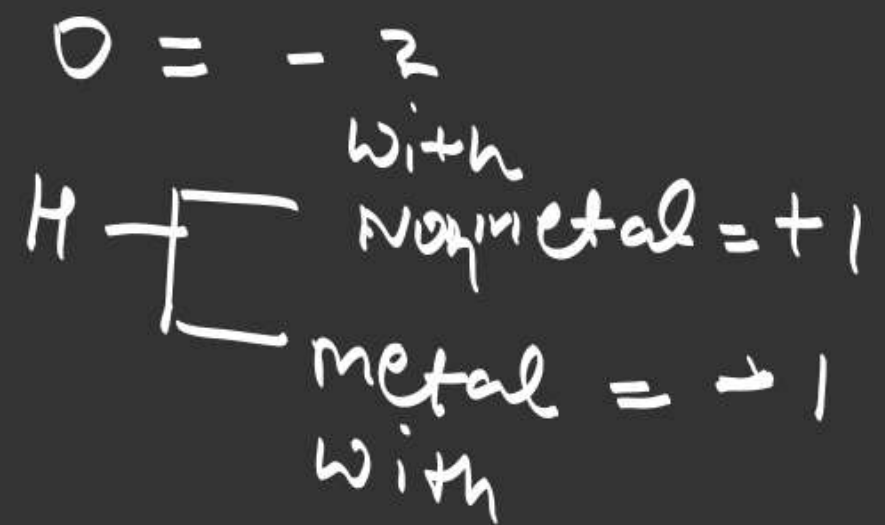
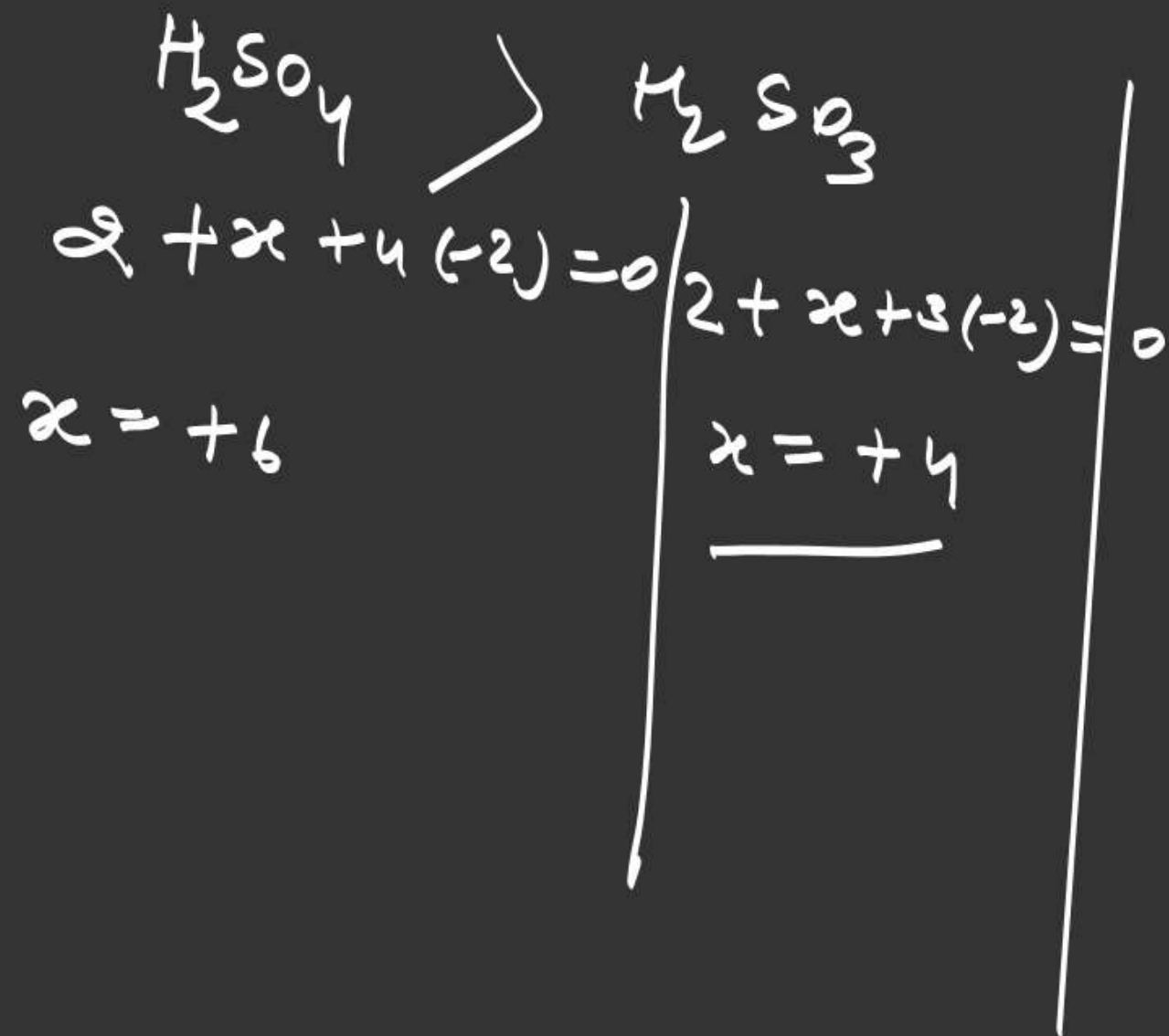


Order of acidic ch.



↑
 tive charge ↑ c.n ↑ acidic ch. ↑





Ques Which of the following
Solvent is better solvent (Ionic compound)
for KI

① $\epsilon_0 = 1$

② $\epsilon_0 = 2$

③ $\epsilon_0 = 10$

~~④~~ $\epsilon_0 = 32$

Key point

if $\epsilon-n$ diff \uparrow Ionic ch. \uparrow bond weak in water

L.E