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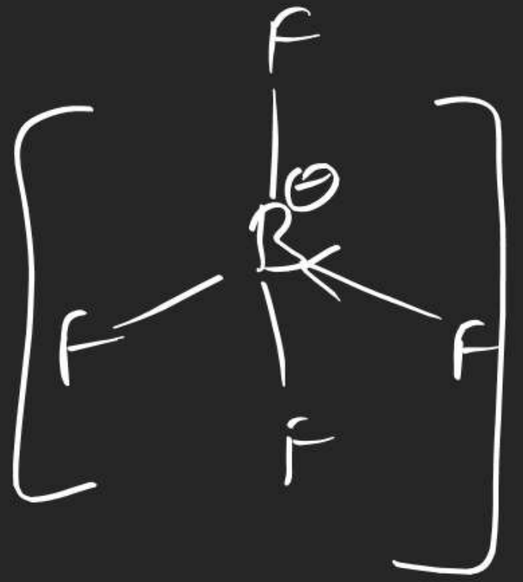

Que BF_3 undergoes in partial hydrolysis
While BCl_3 undergoes in Complete hydrolysis
Why?

Ans — because of complex formation

$$BF_3 + 3H_2O \longrightarrow B(OH)_3 + 3HF$$

$$3BF_3 + 3HF \longrightarrow 3H[BF_4]$$

$$4BF_3 + 3H_2O \longrightarrow B(OH)_3 + 3H[BF_4]$$

BCl_3

$[BCl_4]^{\ominus}$ does not exist

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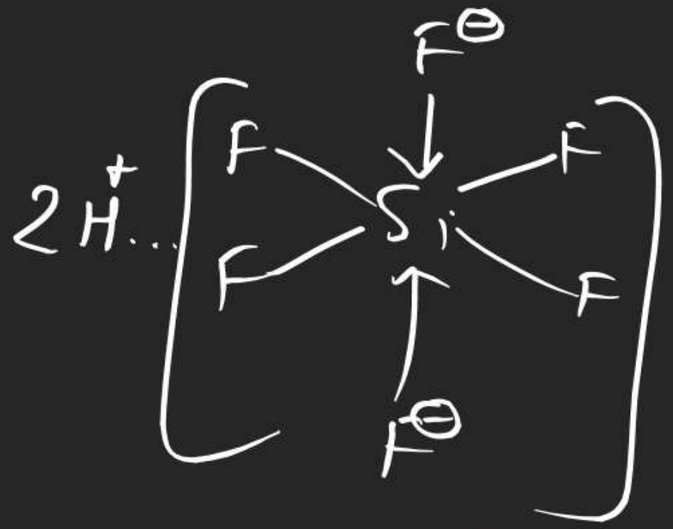
Que SiF_4 undergoes in partial Hydrolysis while $SiCl_4$ undergoes in complete Hydrolysis

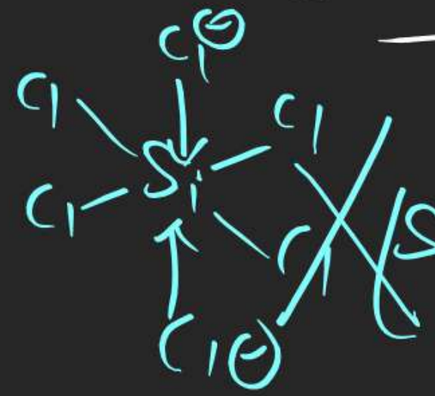


Ans → due to formation Complex

$$SiF_4 + 4H_2O \longrightarrow H_4SiO_4 + 4HF$$

$$2SiF_4 + 4HF \longrightarrow H_2[SiF_6]$$

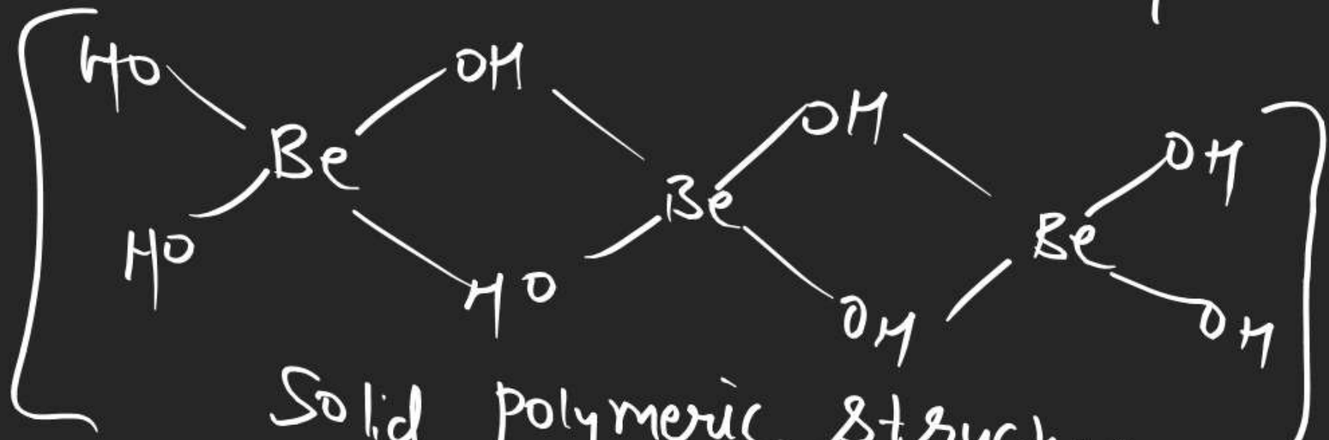
$$3SiF_4 + 4H_2O \longrightarrow H_4SiO_4 + 2H_2[SiF_6]$$



$[SiCl_6]^{-2}$ — does not exist due to steric rep.

$BeCl_2 + H_2O \longrightarrow Be(OH)_2 + HCl$

$[Be(OH)_2]_n$



Solid polymeric structure

sp^3 hyb. non planar

$$BeCl_2 + 2NaOH \longrightarrow [Be(OH)_4]^{-2} + 2NaCl$$

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$\overset{+1}{HClO}$

$\overset{+3}{HClO_2}$

$\overset{+5}{HClO_3}$

$\overset{+7}{HClO_4}$

Hydrolysis of Interhalogen Compound

$\overset{+1}{I}Cl + H^+-OH^- \longrightarrow HOI + HCl$

$\overset{+3}{Cl}F_3 + H^+-OH^- \longrightarrow HClO_2 + HF$

$Br_2F_5 + H^+-OH^- \longrightarrow HBrO_3 + HF$

$\overset{+7}{I}F_7 + H^+-OH^- \longrightarrow HIO_4 + HF$

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Hydrolysis of noble gas Compound

Note → $Xe(OH)_2 \longrightarrow XeO + H_2O$

(Unstable)

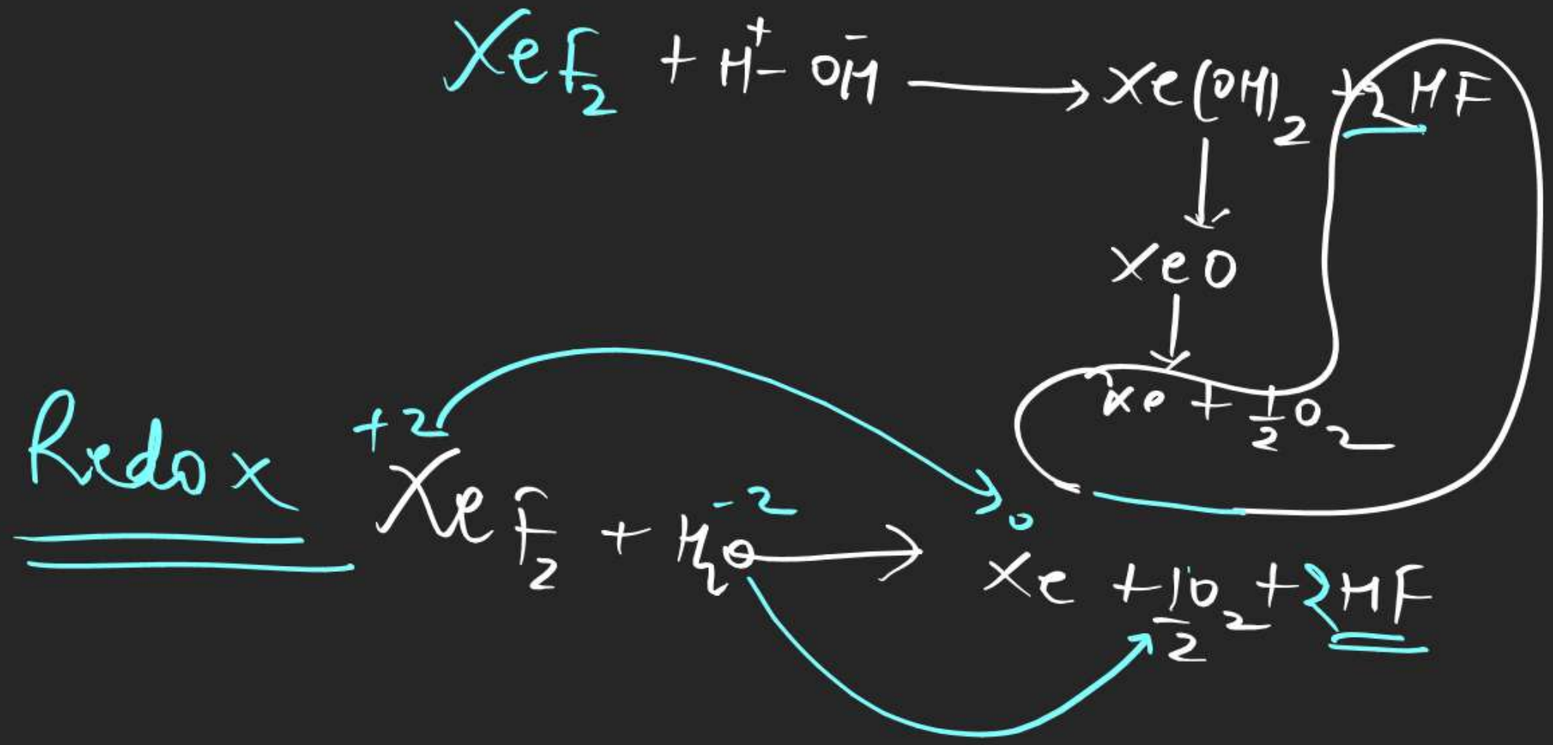
$XeO \downarrow$

$Xe + \frac{1}{2}O_2$

Note → $Xe(OH)_4 \longrightarrow XeO_2 + H_2O$

$XeO_2 \downarrow$

$Xe + XeO_3 + O_2$



$$XeF_4 + H_2O \longrightarrow Xe + XeO_3 + O_2 + HF$$

Step wise Hydrolysis

$$XeF_6 + H_2O \longrightarrow XeOF_4 + 2HF$$

$$XeOF_4 + H_2O \longrightarrow XeO_2F_2 + 2HF$$

$$XeO_2F_2 + H_2O \longrightarrow XeO_3 + 2HF$$

$$XeF_6 + 3H_2O \longrightarrow XeO_3 + 6HF$$

(Complete Hydrolysis)

(XeO_3 — explosive)

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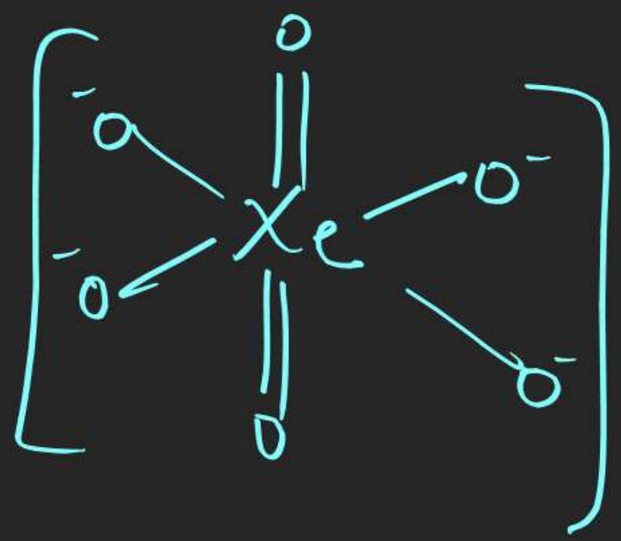
(alkaline hydrolysis)

$XeF_6 + NaOH \longrightarrow XeO_3$

$XeO_3 \xrightarrow{OH^-}$ (unstable) $HXeO_4^-$ (Xenate ion)

$HXeO_4^- \longrightarrow$ (Perxenate ion) $XeO_6^{4-} + Xe + O_2$



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Rate of hydrolysis

H_6TeO_6 (telluric acid)

No Hydrolysis due to steric crowding

size ↑ Steric crowding ↓ rate of hydrolysis ↑

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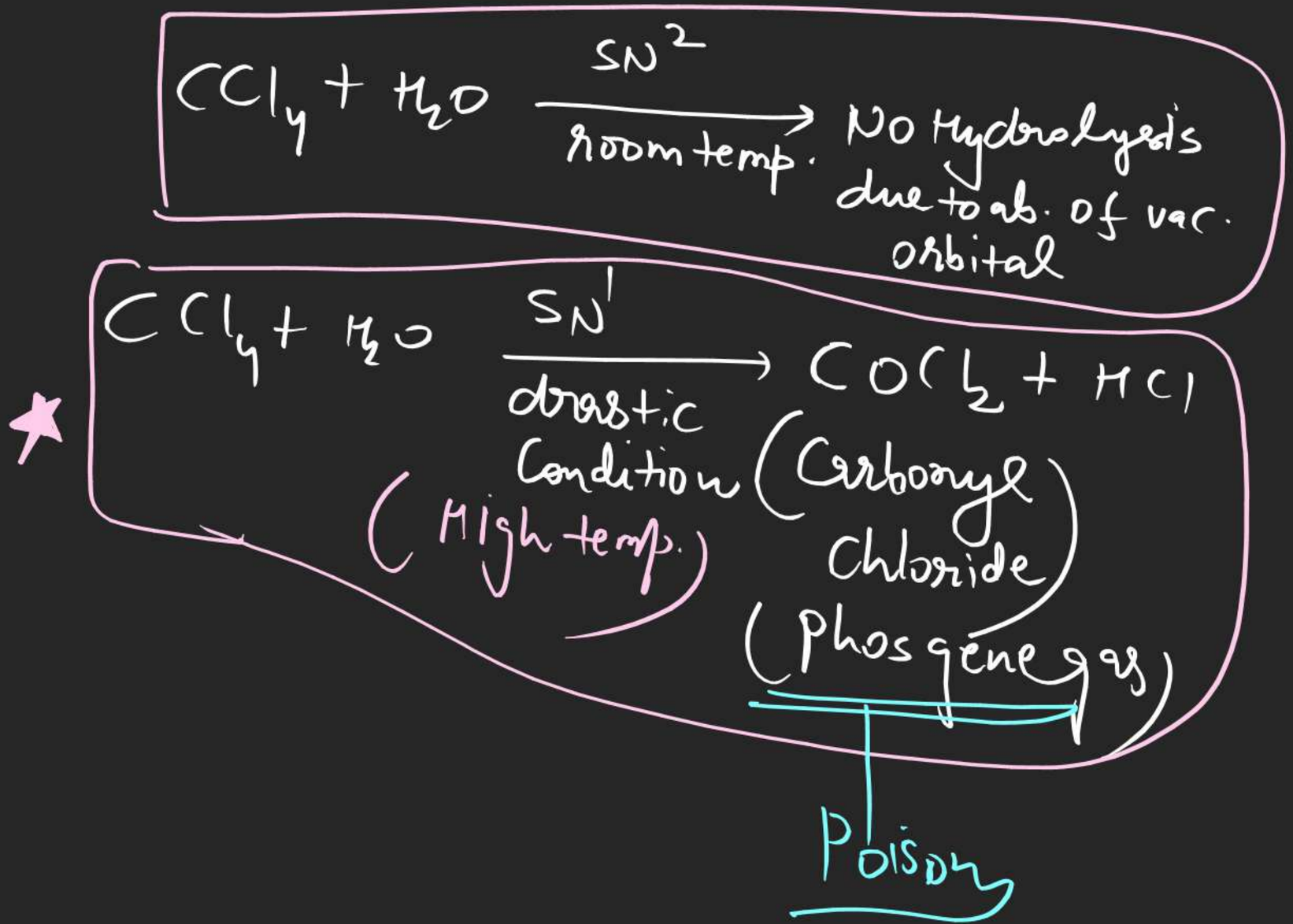

$NF_3 + H_2O \xrightarrow[\text{room temp.}]{SN^2}$ no Hydrolysis (due to absence of vac. orbital)

$NF_3 + H_2O \xrightarrow[\text{drastic Condition}]{SN^1} \underline{N_2O_3} + \underline{HF}$

$NF_3 \longrightarrow NF_2^+ + F^\ominus$

$F_2N^+ + H_2\ddot{O}: \longrightarrow F_2N-\overset{+}{O}(H)(H) \longrightarrow F_2N-OH$

$H^+ + F^\ominus \longrightarrow HF$

$F_2NOH + H_2O \xrightarrow[-HF]{} F-N(OH)(OH) \xrightarrow[-H_2O]{} F-N=O$

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{ DPP — up to Hydrolysis
{ Sheet — up to Hydrolysis

Molecule do not exist

test 30th April

Silicate

Odd e⁻ molecule

V.W.F

Bent's Rule

JEE Mains

Dragol's

Back bonding

Bridge bonding

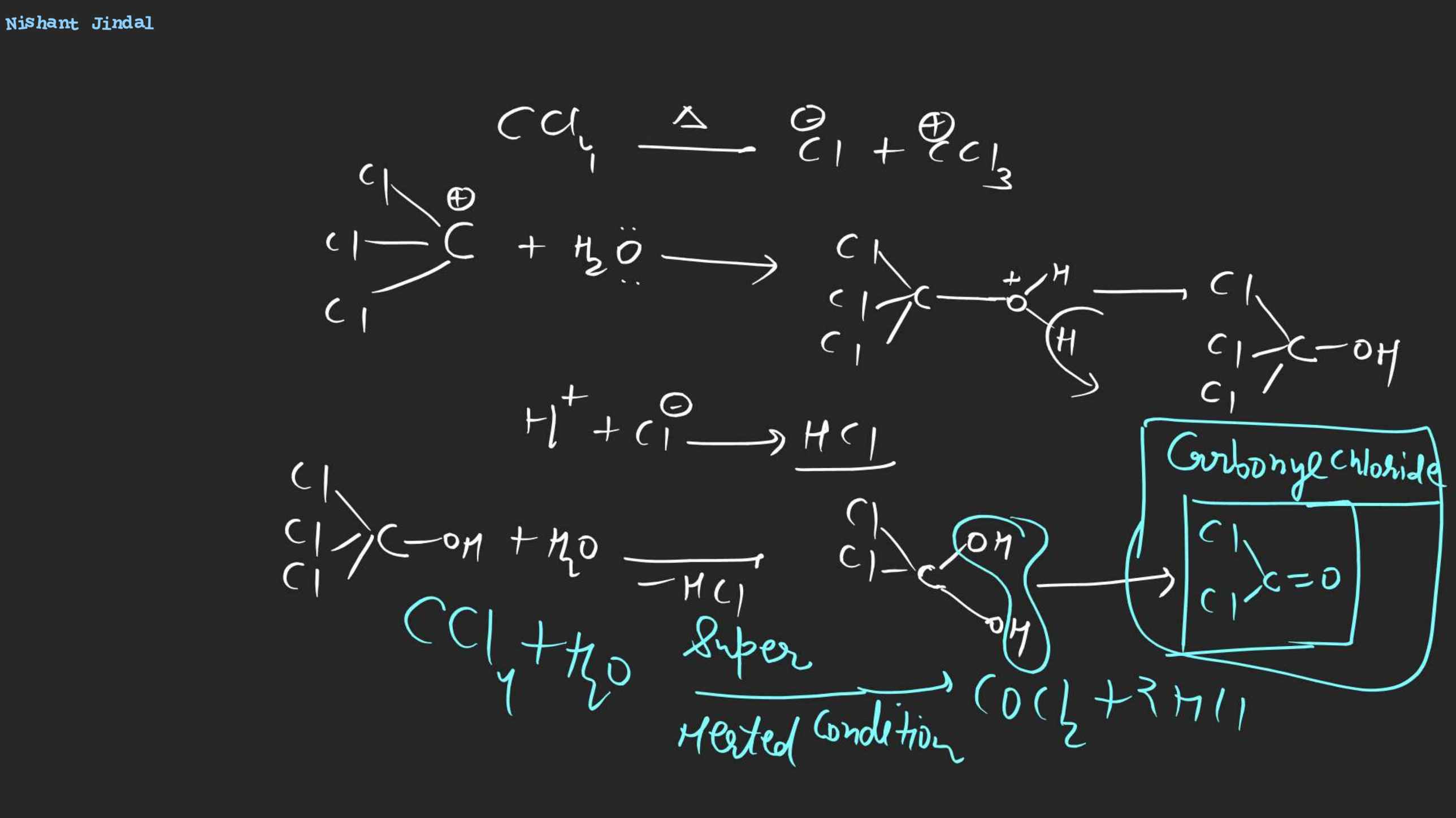
End

Hydrolysis

$$f-N=O + H_2O \xrightarrow[-HF]{} \underset{\text{(nitrous acid)}}{OH-N=O\ (HNO_2)}$$

↓ unstable

N_2O_3



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Ionic Compound [Fajan's Rule]