Electronegativity - II

Course on Periodic Table for Class IX 2023

Vishal joshi • Lesson 2 • July 24, 2021

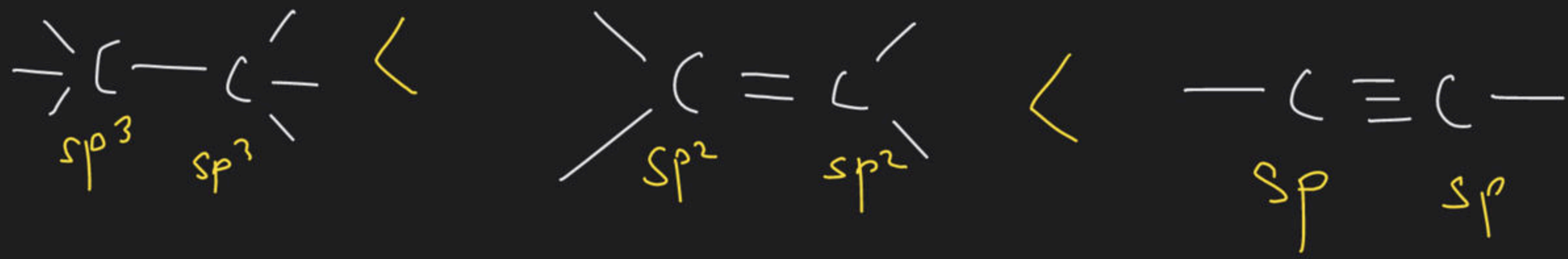
Hybrid Orbital

$sp > sp^2 > sp^3$

$\frac{1}{2} \times 100$ $\quad$ $\frac{1}{3} \times 100$ $\quad$ $\frac{1}{4} \times 100$

$= 50\%$ $\quad$ 33.33% $\quad$ 25%

and



(1)

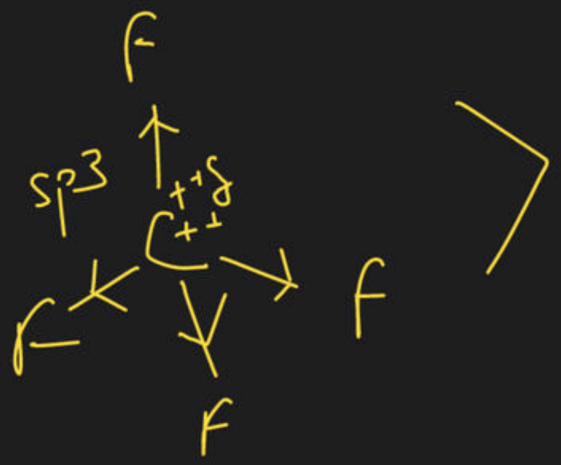
E.N dep. on O.S (+ive)

$Fe^{+2} < Fe^{+3}$

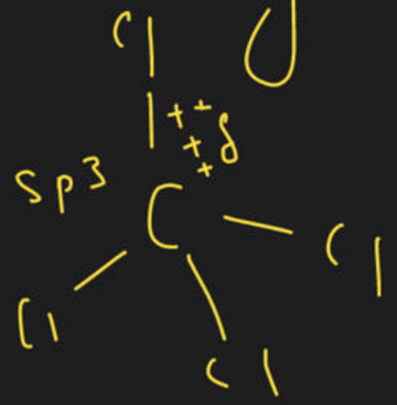
+ive charge ↑ att ↑ E.N ↑

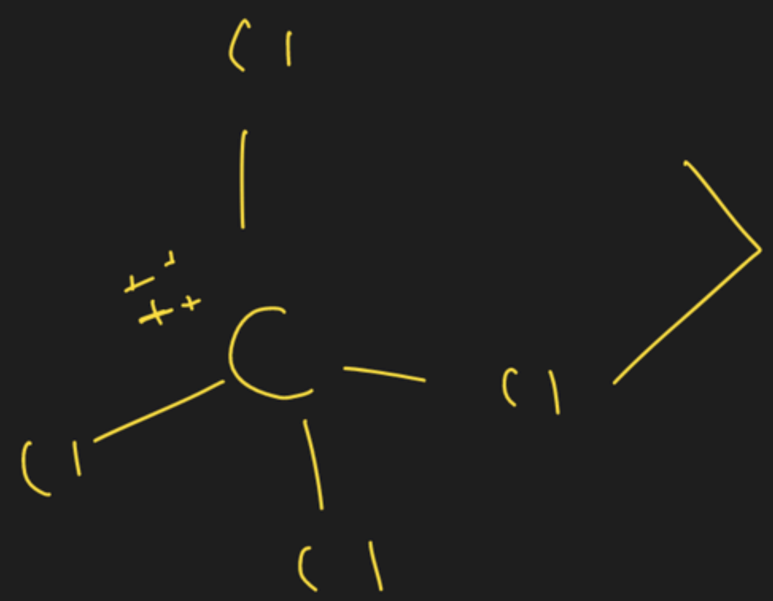
$Al < Al^{+} < Al^{+3}$

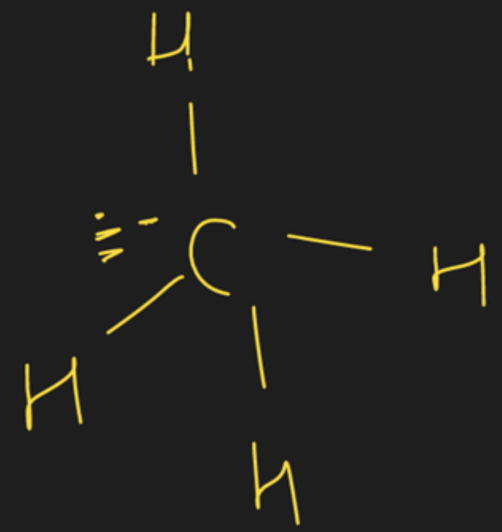
(7) E.N also dep. on Surrounding atom



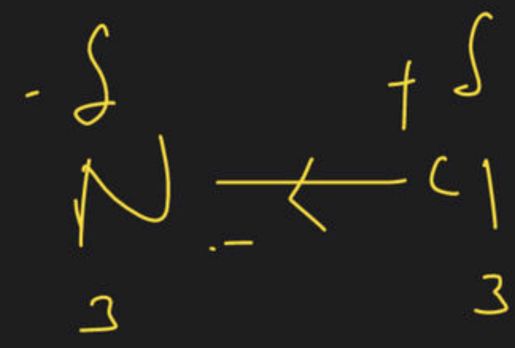
>







Note



Zeff of N > Zeff of Cl

due to small size

due to large size

H — H [non polar]

$^{+\delta}$H — F $^{-\delta}$ (polar)

δ+
δ+
δ+
δ+

$$\overset{-\delta}{P} - \overset{+\delta}{H}$$

2.12 2.10

{least polar bond in fifteen group}

Eg Which of the following bond is least polar in 15th group

(1) N–H (2) P–H (3) As–H (4) Sb–H

Trends

$\longrightarrow R$ $\quad$ $E.N \uparrow$

$Z_{eff} \uparrow$ $\quad$ size $\downarrow$ $\quad$ and $\quad$ $E.N \uparrow$ [Except Noble gas]

Note = $E.N$ of Noble gas $= 0$ [Acc. to pauling]

Note = Down the group $E.N \downarrow$ but in Al family does not follow]

11 → Nov.

April —

11 12

Chemistry 12

(P + M) 11 11

12 → Nov.

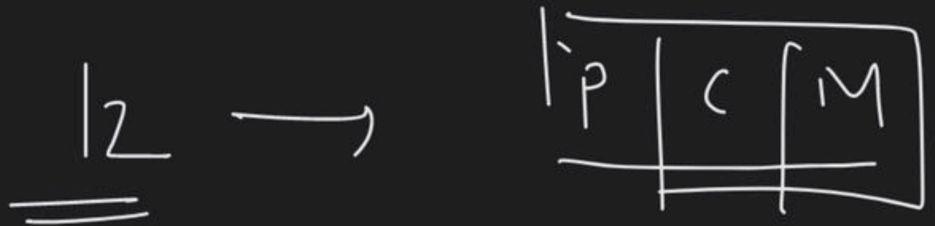
(11 + 12) → Chemistry

10 → 1 year Chemistry → Nov. – X (120 / 101) 90

11 →

12 –

Kvpy



Nuv

Kvpy

Properties affected by Electronegativity

(1) More E.N diff, more partial charge, more ionic ch. and more polarity

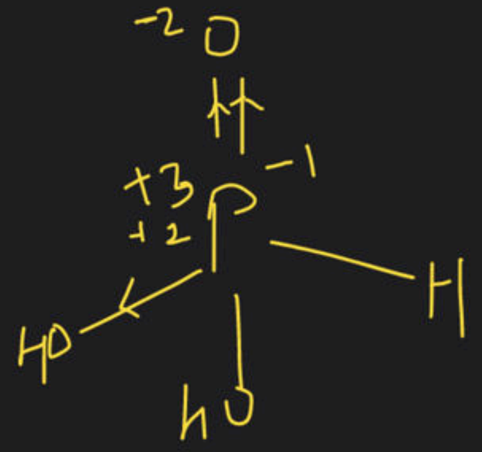
% Ionic ch = $(16\Delta + 3.5\Delta^2)$

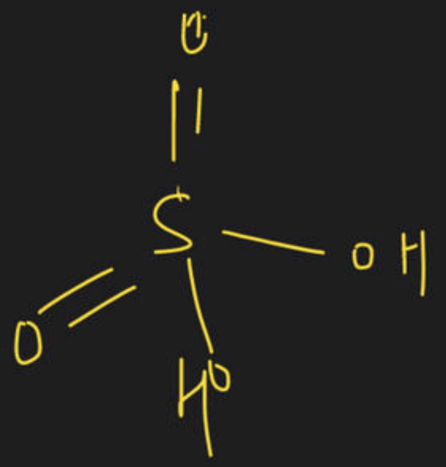
(Henry Smith)

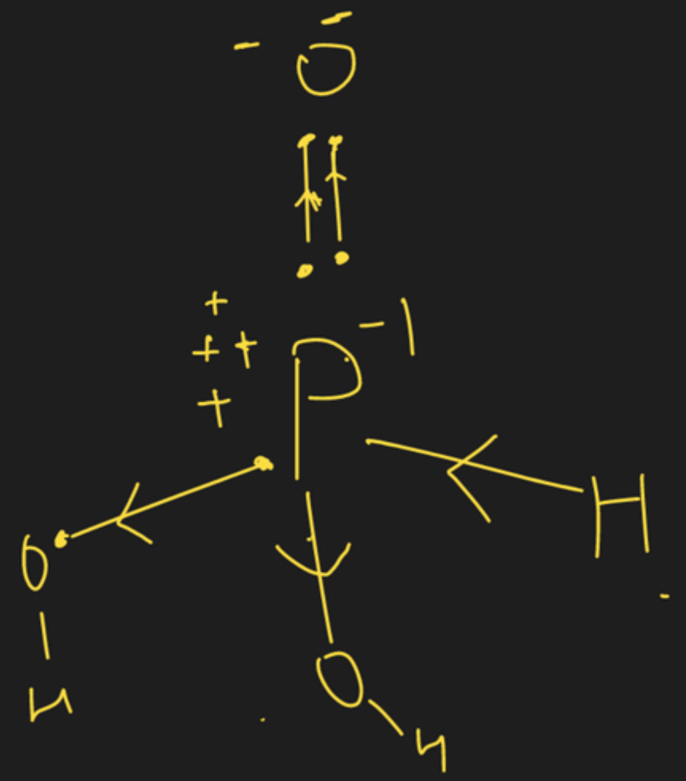
Δ = E.N diff

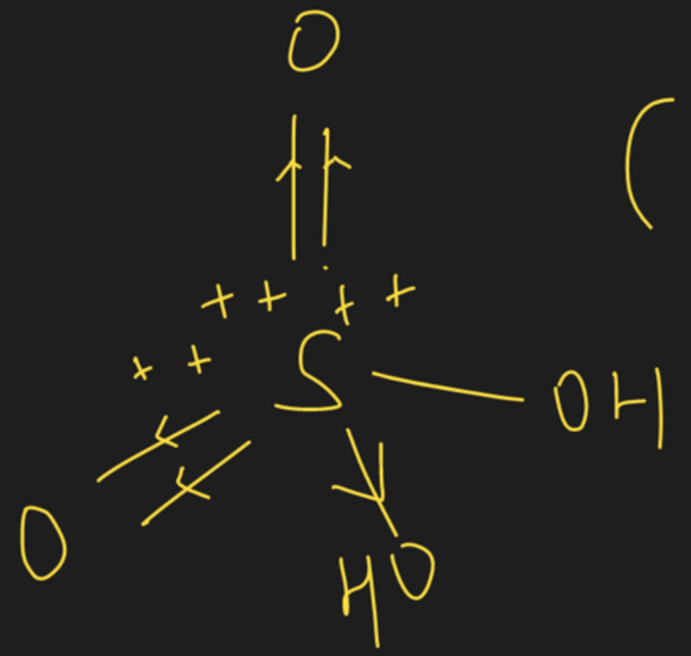
H–F > H–Cl > H–Br > H–I

0.5 g P in H_3PO_3 in following structure

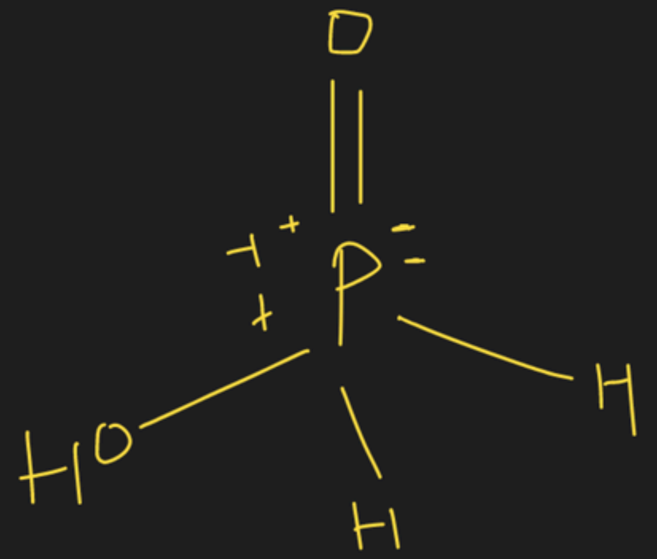


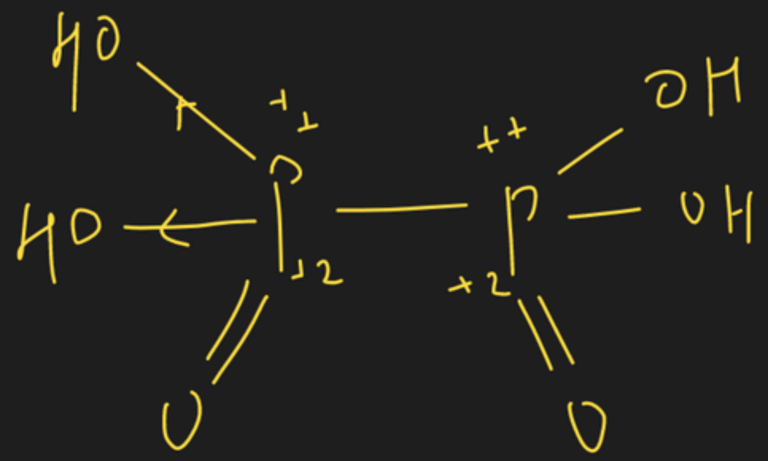






(Sulphuric acid)


O
P
H
HO
H


HO
HO
OH
OH
O
O
+1
+2
+1
+2

② Comparision of Bond length and Bond strength

if E.N diff ↑ then b.L ↓ and bond strength ↑

(Keeping other parameters constant like size - similar and hybridisation)

Strength H-F > H-O > H-N

Bond length H-F < H-O < H-N

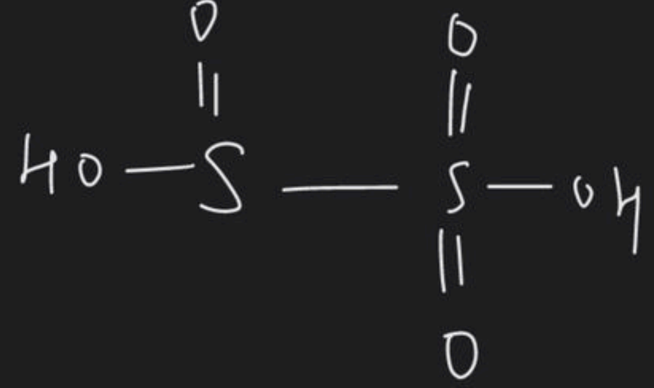
H — H H - Cl

We can't compare H-H and H-Cl on the basis of this factor size of Cl too much greater than that of H

Q. Which of the following bond is least polar

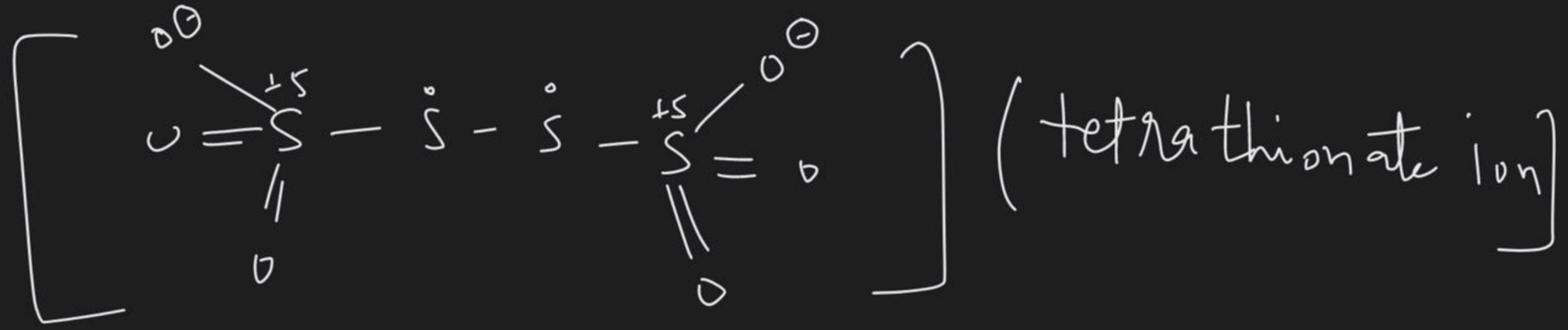
(1) C–H (2.5, 2.1) (2) N–H (3, 2.1) (3) O–H (3.5, 2.1) (4) F–H (4, 2.1)

Sol.



0.5 g both S $[H_2S_2O_5$ (Pyrosulphurous acid$]$

(1) +5, +5 (2) +3, +3 (3) +5; +3 (4) none



(tetrathionate ion)

(a) +5, 0 (b) +6, 0 (c) +8, 0 (d) none

Ques find the ionic ch. in HCl

(1) 17.235 (2) 15 (3) 12% (4) 20%.

$= 16\Delta + 3.5\Delta^2$

$= 6 \times (.9) + 3.5 (0.9)^2$

17.235

H = 2.1
Cl = 3

B = 2

A' = 1.61

G_9 = 1.81

Ih = 1.78

Tλ = 1.62

2.1 H

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

3 (1