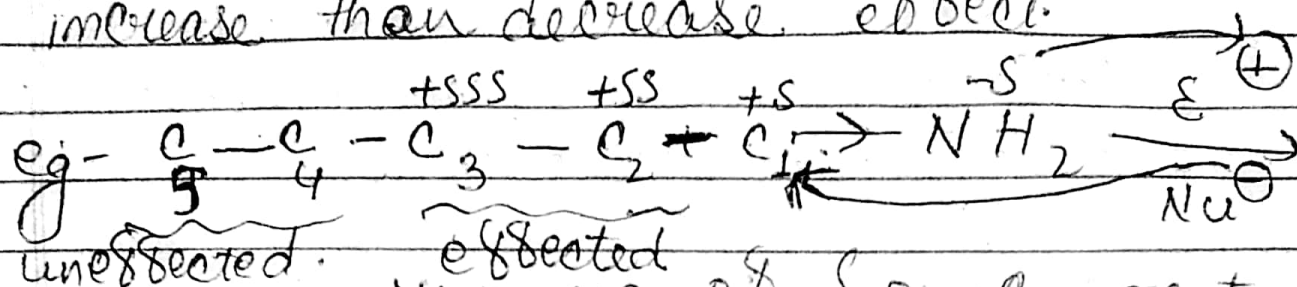


\* No. of delta inversely proportional to effect i.e. when no. of delta increase then decrease effect.



Here no. of S on  $\text{C}_1$  greater than on  $\text{C}_3$ , but carbon & difference of electronegativity. Types of inductive effect  $\text{C}_1$  greater than  $\text{C}_3$ .

Positive inductive effect

⇒ when atom/group having electron gain tendency less than hydrogen atom.

eg - alkyl group  
i.e.  $\text{CH}_3, \text{C}_2\text{H}_5, \text{C}_3\text{H}_7$  etc.

→ It increase basic nature,  $K_b$  value,  $\text{pK}_a$  value,  $\text{pH}$  value but decrease  $K_a$  value,  $\text{pK}_b$  value,  $\text{pOH}$  value.

→ This effect occurs up to 3C from the functional group.

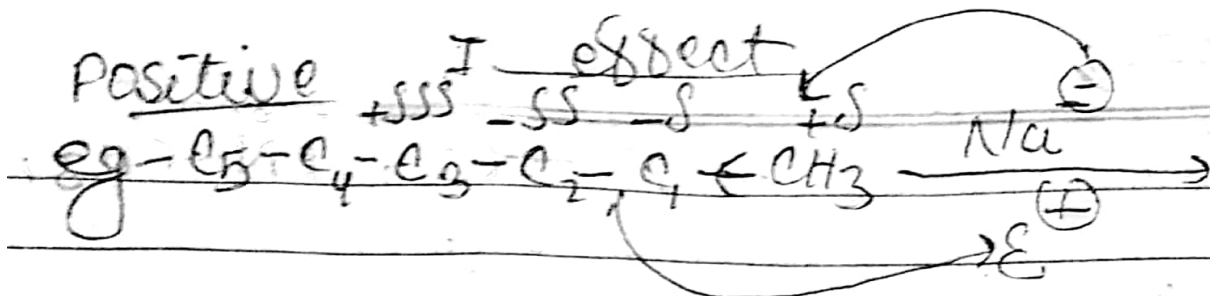
Negative inductive effect

⇒ when atom/group having electron gain tendency greater than hydrogen atom.

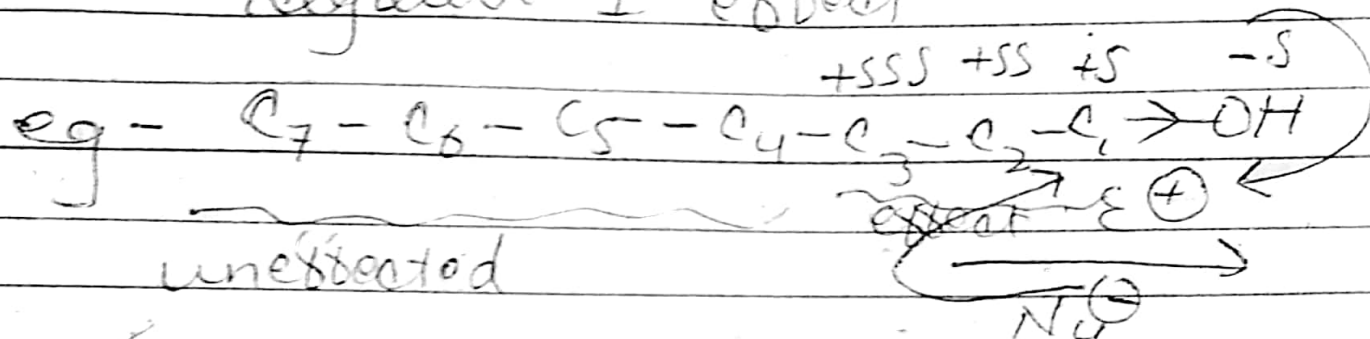
eg -  $\text{OH}, \text{NH}_2, \text{CHO}, \text{NO}_2, \text{COOH}, \text{CN}$  etc.

→ It decrease basic nature,  $K_b$  value,  $\text{pK}_a$  value,  $\text{pH}$  value but increase  $K_a$  value,  $\text{pK}_b$  value &  $\text{pOH}$  value.

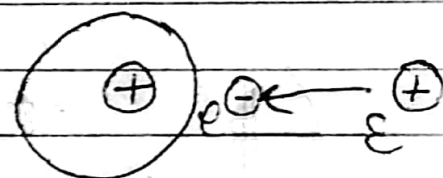
→ This effect occurs up to 3C from the functional group.



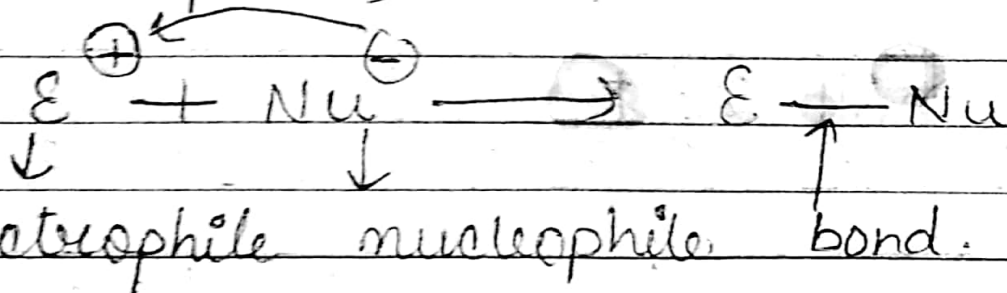
Negative I effect



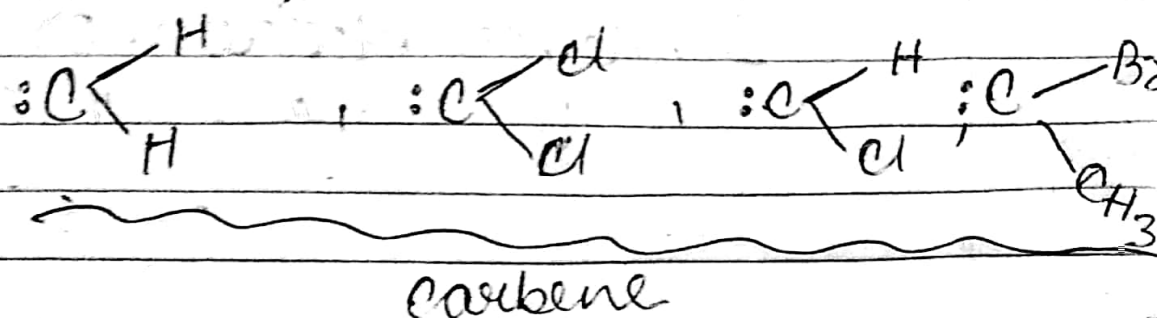
(1) Electrophile :-  
Electronophile = Love



Those species which having deficiency of electrons hence take electron from other. (more electron & species i.e nucleophile) & make bond.



eg- carbene & nitrene acts as electrophile because less than 8, electrons on carbene & nitrene (6 electrons).



but  $:\ddot{\text{N}}-\text{H}$ ,  $:\ddot{\text{N}}-\text{Cl}$ ,  $:\ddot{\text{N}}-\text{CH}_3$ ,

$:\ddot{\text{N}}-\text{C}_2\text{H}_5$

## nitrenes

$\Rightarrow$  All cation (having +ve) acts as electrophiles.

eg -  $\text{H}^+$ ,  $\text{Al}^+$ ,  $\text{Bx}^+$ ,  $\text{F}^+$ ,  $\text{NO}_2^+$ ,  $\text{SO}_3\text{H}^+$   
~~etc~~ etc.

except metal ion having inert gas configuration (i.e. not acts as  $\text{E}^+$ ,  $\text{Nu}^-$ ).

$\text{Li}^+ \rightarrow 2e = \text{He}$ ,  $\text{Na}^+ = 10e = \text{Ne}$ ,

$\text{K}^+ \rightarrow 18 = \text{Ar}$ ,

$\text{Mg}^{++} \rightarrow 10e = \text{Ne}$  etc.

$\Rightarrow$  All octet deficient species (central atom having less than 8 electrons)

eg -  $\text{AlCl}_3$ ,  $\text{BF}_3$ ,  $\text{ZnCl}_2$ ,  $\text{SnCl}_2$ ,  $\text{FeCl}_2$ ,  $\text{FeCl}_3$  etc.

eg -  $\text{AlCl}_3$ .

Valence electron of  $\text{Al} = 3$

"

"

"

$\text{Cl} = 7 \times 3 = 21$

total = 24.