⇒ Bond dissociation Energy

Minimum

Energy Required to Break any Particular Bond is known as Bond dissociation Energy

Ex:- For CH_4

(BDE)

C–H ...

$CH_4 \longrightarrow \dot{C}H_3 + H^{\bullet}$ — ΔH_1 ✓

$\dot{C}H_3 \longrightarrow CH_2 + H$ — ΔH_2 ✓

$CH_2 \longrightarrow CH + H$ — ΔH_3 ✓

$CH \longrightarrow C + H$ — ΔH_4 ✓

Bond Energy (C–H) = $\frac{\Delta H_1 + \Delta H_2 + \Delta H_3 + \Delta H_4}{4}$

Note :- Bond Energy is average of B.D.Energy.

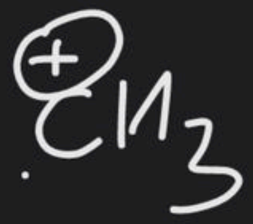
Reaction intermidiate

Species obtained during any Reaction between Reactant & product is known as Reaction intermidiates.

Ex: (i) Carbocation
(ii) Carbanion
(iii) Carbon free Radical

(iv) Carbene CH_2
(v) Nitrene N–H
(vi) Benzyne

Carbocation



Carbanion

Carbon free Radical

⇒ Trivalent

⇒ Incomplete octet

⇒ Highly unstable

⇒ Highly Reactive

⇒ Formed By Homolytic Bond fission

⇒ Usually formed in Nonpolar or in gas phase

$\Rightarrow BP = 3$

(Bond pair)

$\Rightarrow UP = 1$

(Unpaired e^-)

$\Rightarrow LP = 0$

(Lone pair)

$\Rightarrow mm = \sqrt{n(n+2)} = \sqrt{3}$

(Magnetic moment)

$= 1.732$ BM

$\Rightarrow SM = 2|S| + 1 = 2\left(\frac{1}{2}\right) + 1$

Spin Multiplicity $= 2$

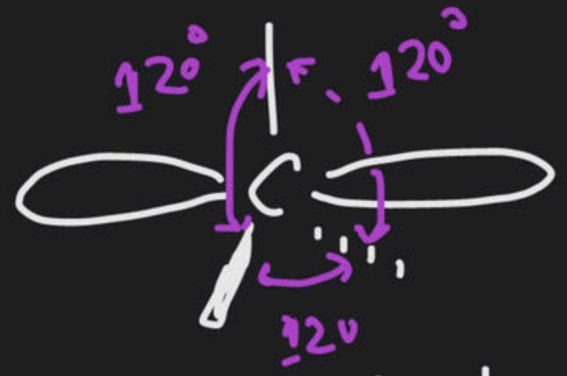
1 unpaired $S = \frac{1}{2}$

2 ——— $S = \frac{1}{2} + \frac{1}{2}$

⇒ Doublet Carbon intermidiate

⇒ sp^2 hybridisation

⇒ Trigonal planer



⇒ Bond Angle = 120°

Electronic Displacement effect

Temporary effect

Such effect appears only in Presence of Some external Reagent & in absence of that Reagent that effect disappears

Permanent effect

Effects which are independent are known as Permanent effects.

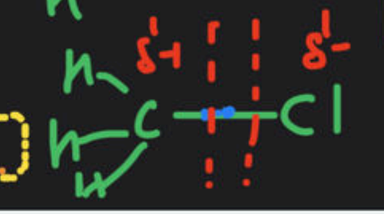
Inductomeric effect (σ e⁻s)

⇒ Temporary displacement in σ e⁻s due to some Reagent

Ex: (a)

$\delta' > \delta$

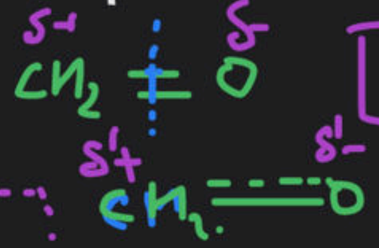
(b) Nu⁻



Electromeric effect (π e⁻s)

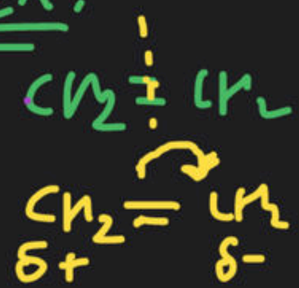
⇒ Temporary displacement in π e⁻s due to some Reagent

Ex:



$\delta' > \delta$

Ex:



$E^{\oplus}$

Permanent effect

Induction

↓

Inductive effect

(σ-e⁻ displacement)

(△En)

Resonance

↓

Resonance effect / Mesomeric effect

(π-e⁻ displacement)

(unhybrid orbital) (p-orbital) π Bond

HyperConjugation

↓

Hyperconjugation effect

(π-e⁻ displacement)

(hybrid orbital) σ bond

Induction

IUPAC (IUPAC)

(211) Benzene-1,2-diol

(212) ——— 1,3 ———

(213) ——— 1,4 ———

(216) methanamine

(217) Ethanamine

(218) ———

(219) Propan-2-amine

(220) ———

(221) N,N-Dimethyl Ethanamine

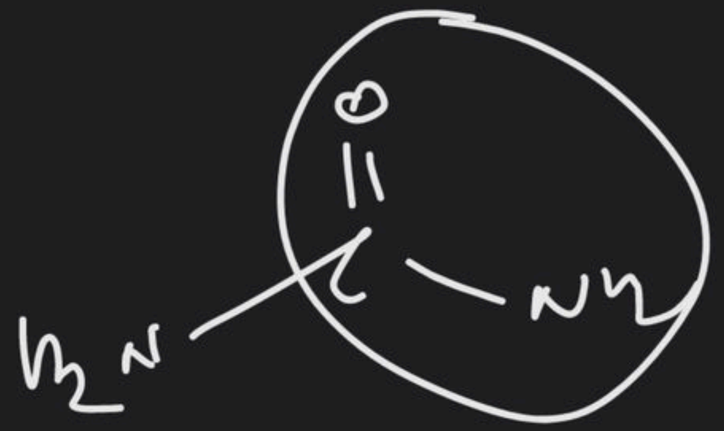
(222) N-Methyl-N-methyl Ethyl propan-1-amine

(223) Pentane-2,3-diamine.

(224) 3,4,5,6 Tetra Methyl Octan-2-amine

(225) 2-Ethylidine Propan-1,3-diamine

226) Amino methanamide



227) —

(220) —

(229) —

(230) (1,2) (3,4) diepoxy Butane.

Question
from Kabyam