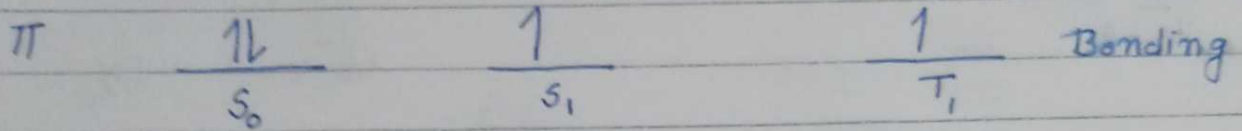
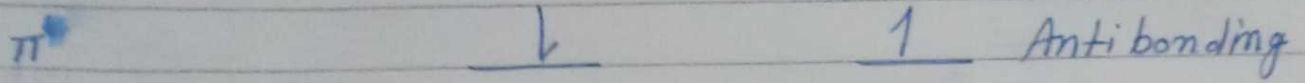


Excited states



No spin inversion

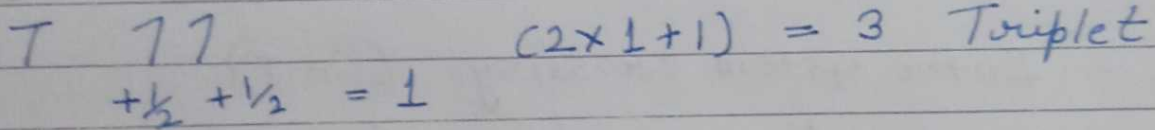
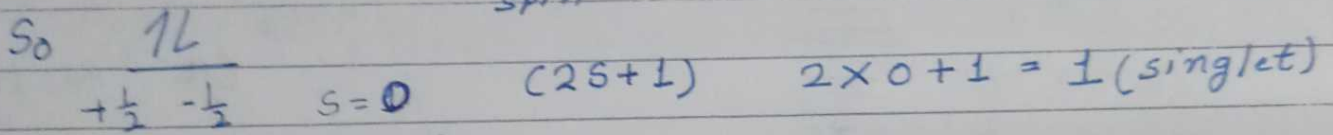
Spin inversion

(singlet)

(Triplet)

(more stable)

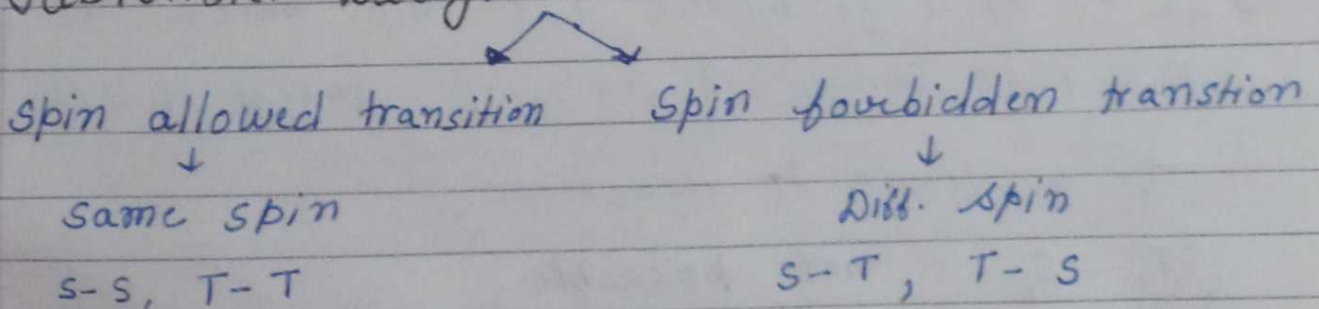
spin

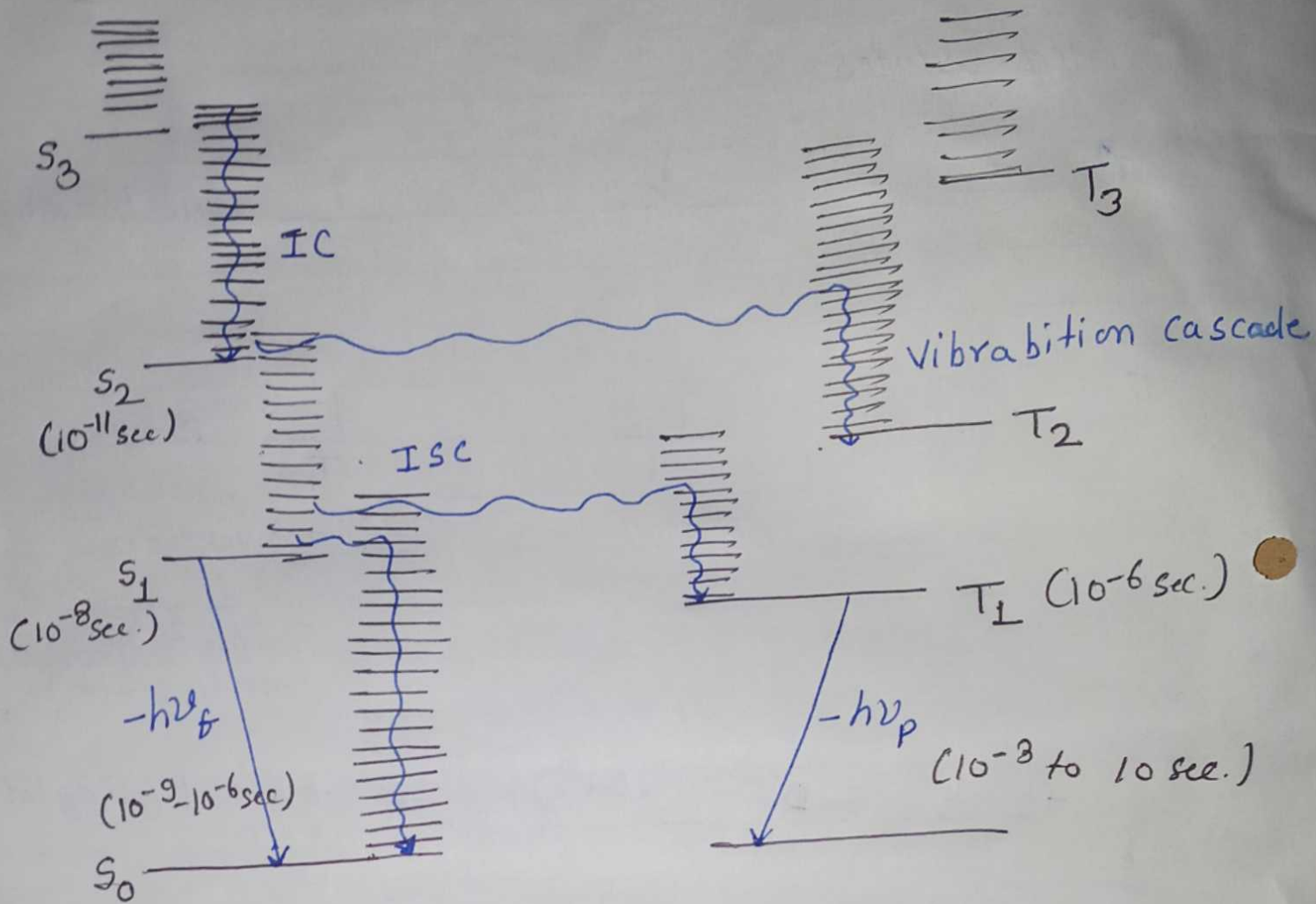


Triplet → more stable → bcoz of same spin
→ less proximity → less inter electronic repulsion.

Modes of Dissipation of Energy:-

Jablonski Diagram :-





ISC - Inter system crossing ($S-T$)

IC - Internal conversion (S_2-S_1)

$h\nu_f \rightarrow S_1 \rightarrow S_0$

$h\nu_p \leftarrow T_1 \rightarrow S_0$

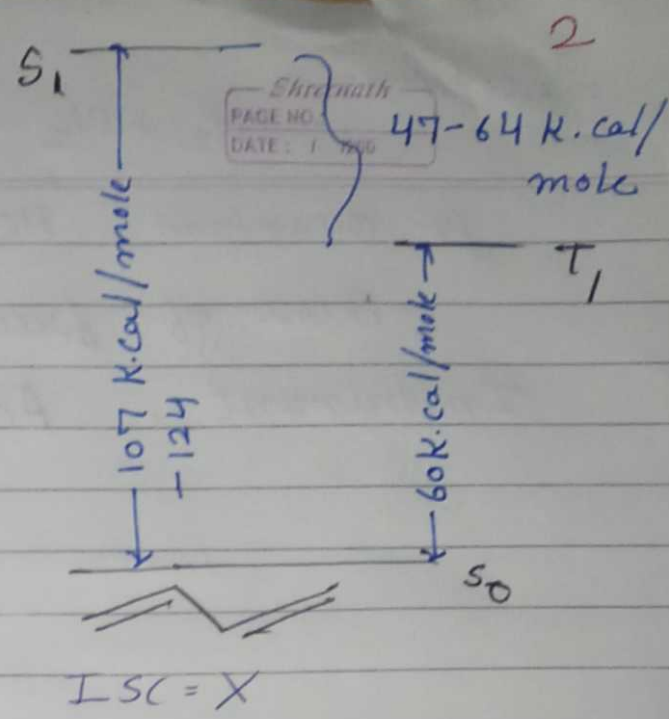
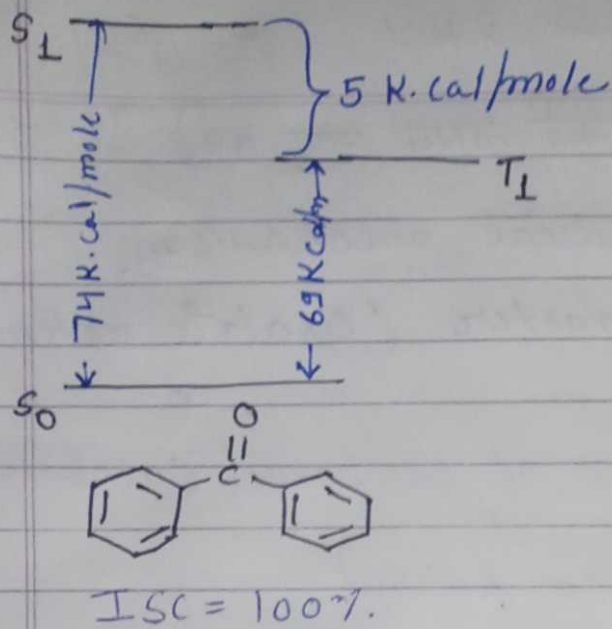
~~~~~ = Radiation less transition

—— = absorption or emission of light.

ISC - spin forbidden but imp. becoz life time of Triplet is more ( $10^{-6}$  sec) Energy is less.

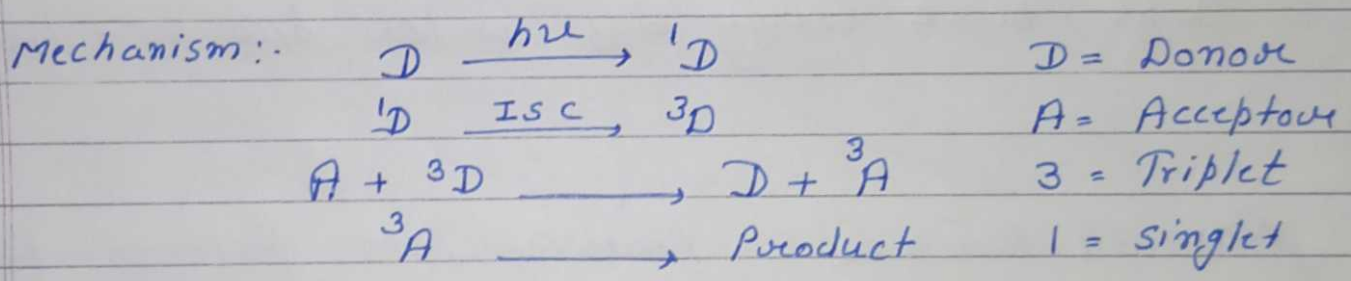
$T_1$  = leads to reactions.

$T_1 - S_1$  = not possible



**Energy Transfer:** - Radiationless and one step rx<sup>n</sup>.

- Excited Donor molecule  $\rightarrow$  Acceptor molecule
- S-S energy transfer (life time कम होता है)
- T-T energy Transfer



**Quantum Yield or Quantum Efficiency :-**

$$\phi = \frac{\text{Number of molecule reacting in given time}}{\text{Num. of quanta absorbed in same time}}$$

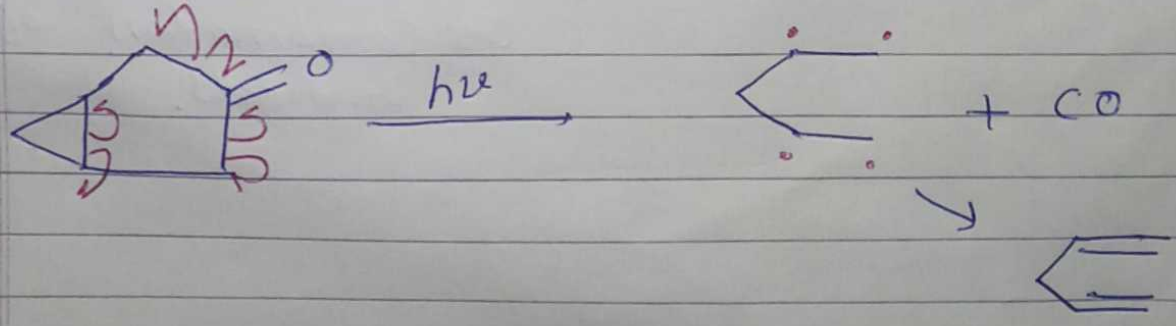
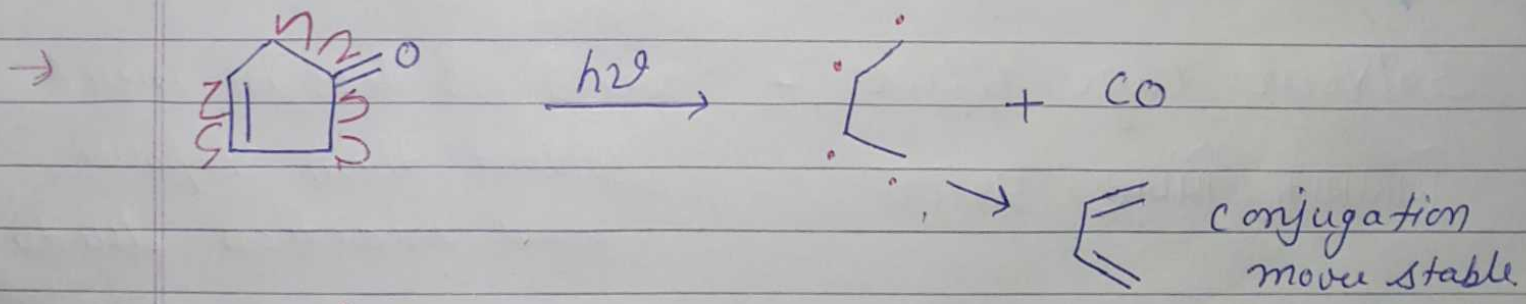
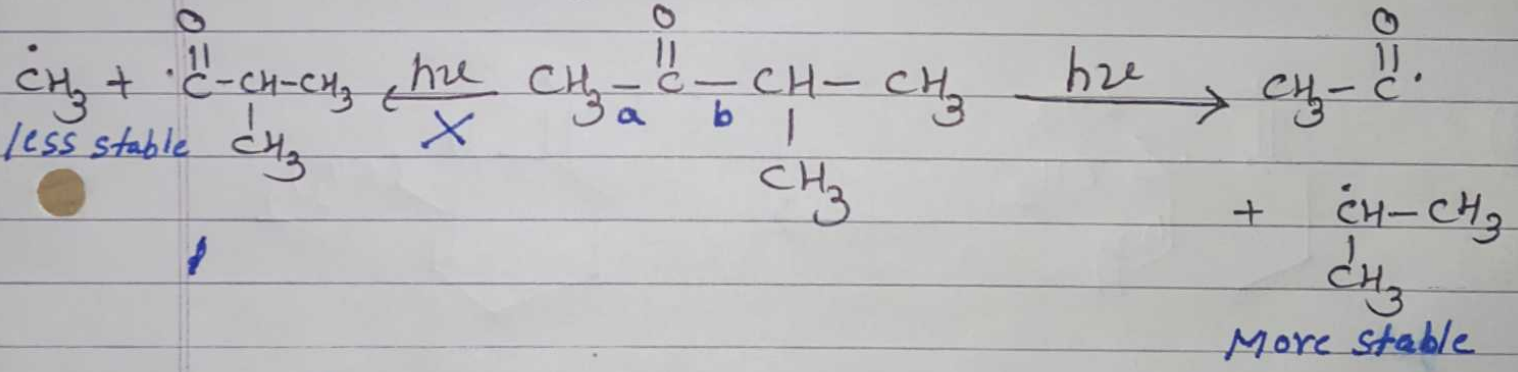
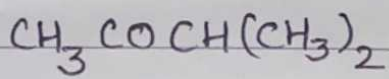
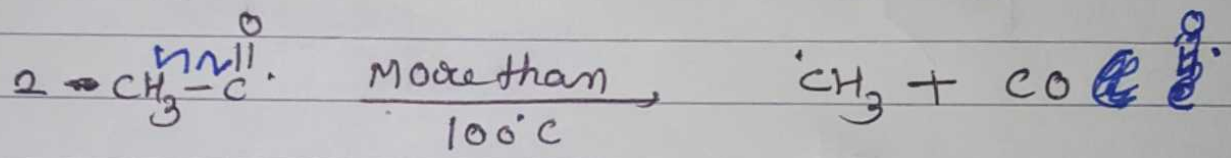
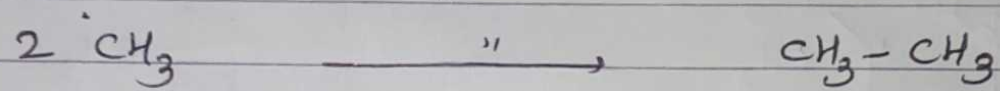
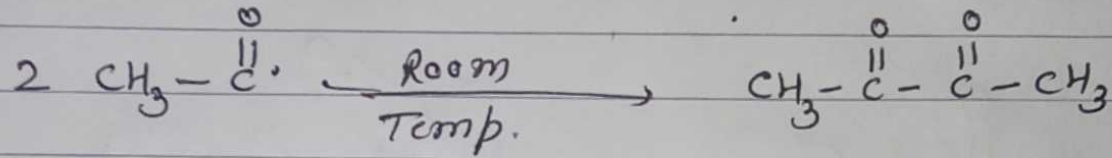
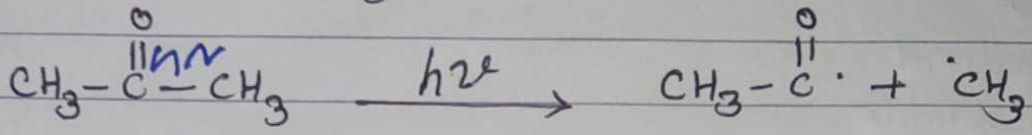
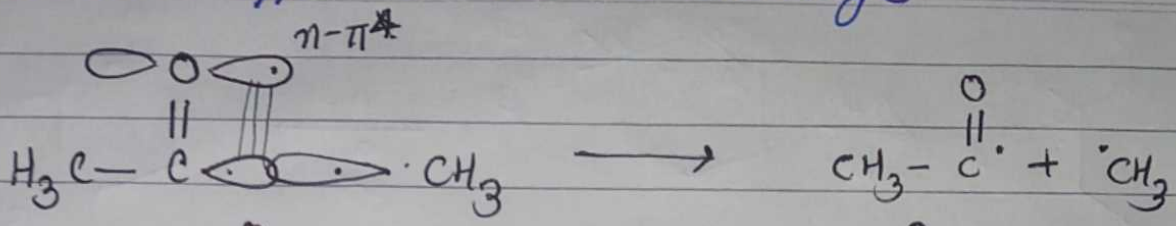
$$\phi = \frac{\text{Number of moles reacting in given time}}{\text{Number of Einstein absorbed in the same time}}$$

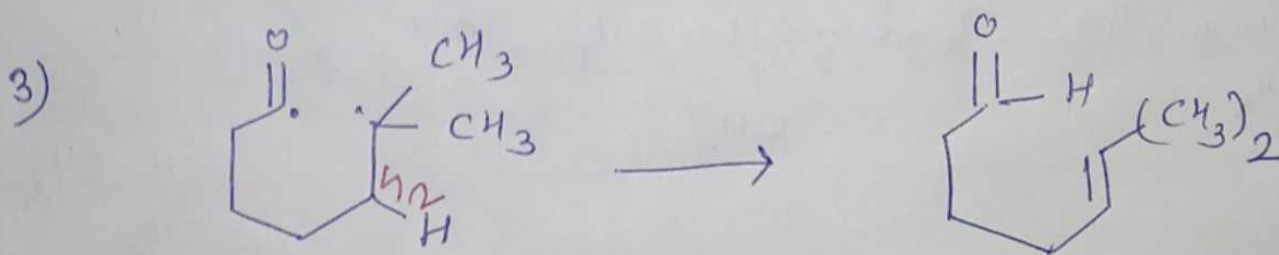
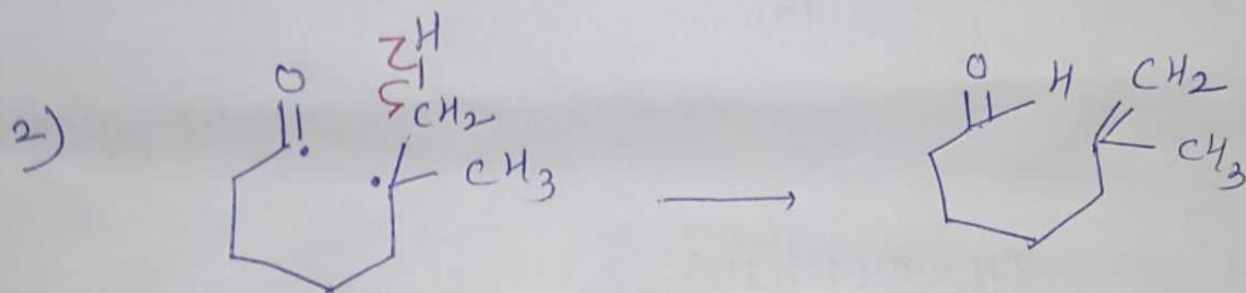
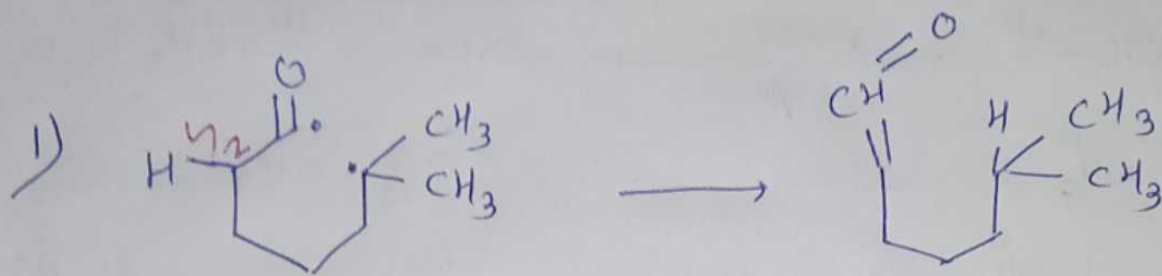
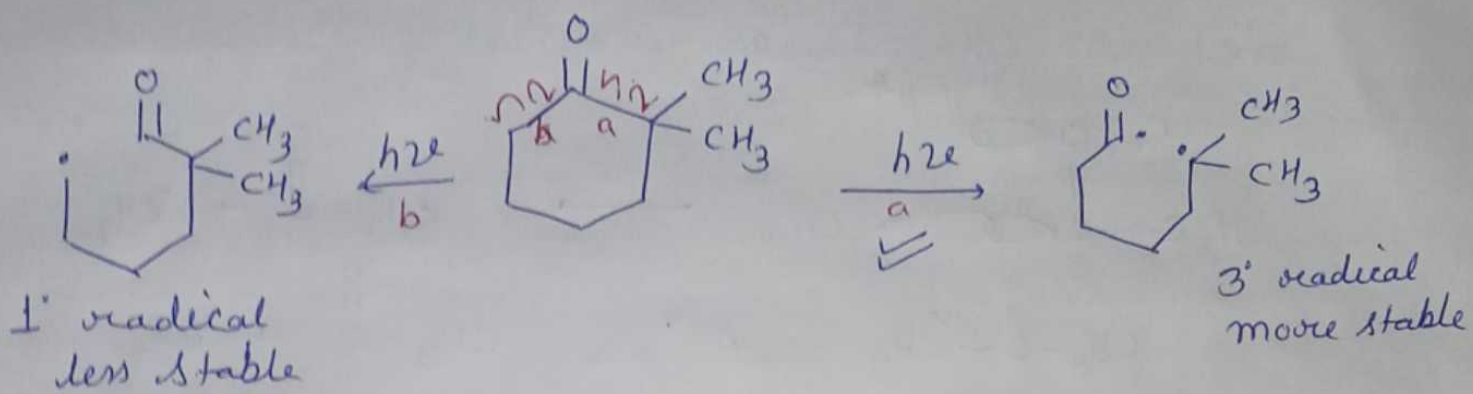
According to Stark-Einstein Law  $\phi = 1$  (must be) but it is less than 1.

Fluorescence, phosphorescence, Radiationless part (waste) होता है।



Noorwich type-I OR  $\alpha$ -cleavage





Solvent cage effect :-

विलायक पिंजर प्रभाव

yield is less in inert solvent than vapour phase reaction due to

re combination of radicals.