

PERICYCLIC REACTIONS.

M.Sc. Sem. II

Unit - III

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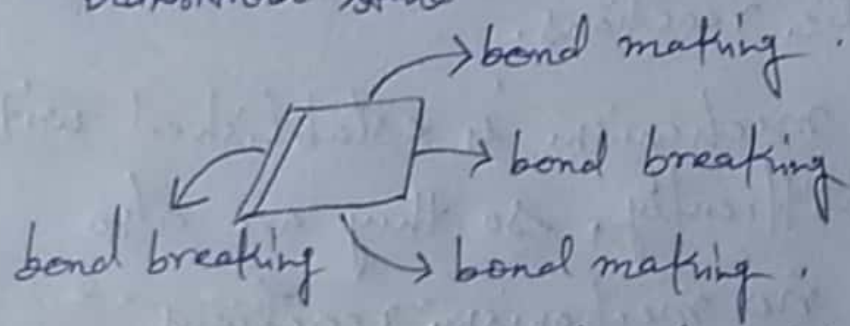
Pericyclic Reactions:

Introduction:

Reaction in which bonding changes occur through reorganisation of electron pairs within a closed loop of interacting orbitals are called Pericyclic reactions.



Bonding changes are concerted via a single transition state —



Both processes - bond making and breaking go side by side.

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Stepwise reactions are reverse to concerted reactions. Though bond making and breaking are simultaneous, it is not implied that their extents are equal. They are highly stereospecific.

They are not affected by any change of solvent or the structural changes within the molecule.

They get initiated either by heat or by light but do not require any other reagent or species. Because of their cyclic transition state, these are called pericyclic reactions.

Their mechanism is established with great difficulty, so they are also called no mechanism reactions.

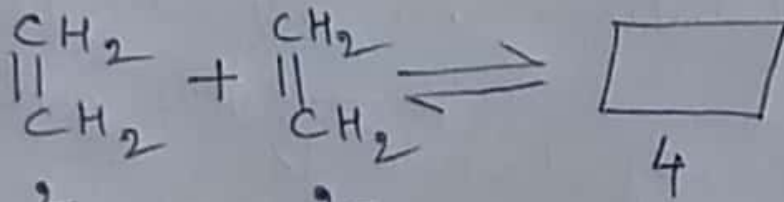
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There are mainly five types of pericyclic reactions :-

- (a) Cyclo addition reactions.
- (b) Electrocyclic
- (c) Sigma tropic
- (d) Chelato tropic
- (e) Group transfer

Cyclo addition reactions:

In cyclo addition reactions, two or more molecule condense to form a cycle or ring by transferring electrons from π bonds to σ bonds -



Carbon units \rightarrow

2

2

No. of electrons from each unit

$2e + 2e$

So, this is a 2+2 cyclo addition reaction. Similarly, we have 2+4 and 4+4 cyclo addition reactions.

(To be continued ...)