A pericyclic reaction is a concerted reaction in which the number of rings in the transition state is greater than the total number of rings in the reactant molecules.

eg: Cope Rearrangement

\[
\begin{array}{c}
\text{Cope Rearrangement} \\
\begin{array}{c}
\text{Mechanism} \\
\begin{array}{c}
\text{\# covalent bonds broken} = 3 \\
\text{\# covalent bonds formed} = 3 \\
\text{\# covalent bonds broken} + \text{\# covalent bonds formed} = 3 + 3 = 6 \\
\text{\# steps} = 1
\end{array}
\end{array}
\end{array}
\]

Thus, the reaction is a concerted reaction. The transition state of the reaction can be drawn roughly as follows.

\[
\begin{array}{c}
\text{\# rings in the reactant molecule} = 0 \\
\text{\# rings in the transition state} = 1 \\
\text{\# rings in the transition state} > \text{\# rings in the reactant molecule}
\end{array}
\]

Thus, the reaction is a pericyclic reaction. For more examples of pericyclic reactions, see Cope elimination, Claisen rearrangement, Diels-Alder reaction.

Contributors

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