

Chemistry Honours

B.Sc. Part I (Hons.)

Organic Chemistry.

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## NOTES

Date

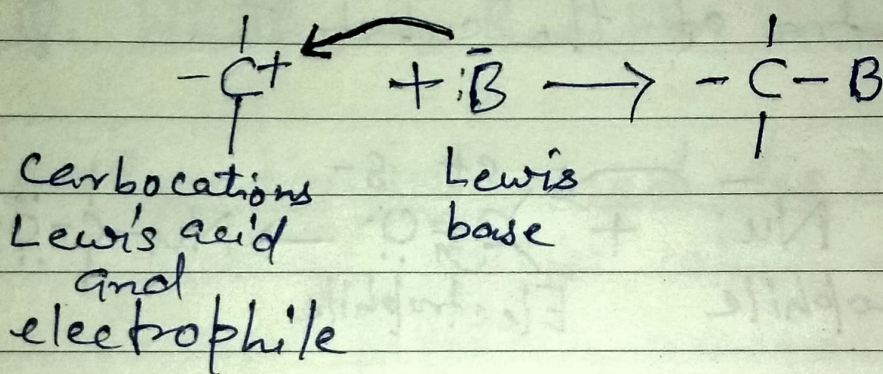
Q. How are reagents classified?

A. Organic reagents are broadly divided into electrophiles and nucleophiles.

- Electrophiles are reagents that seek electrons so as to achieve a stable shell of electrons like that of a noble gas.

- All Lewis acids are electrophiles.

By accepting an electron pair from a Lewis base, a carbocation fills its valence shell.



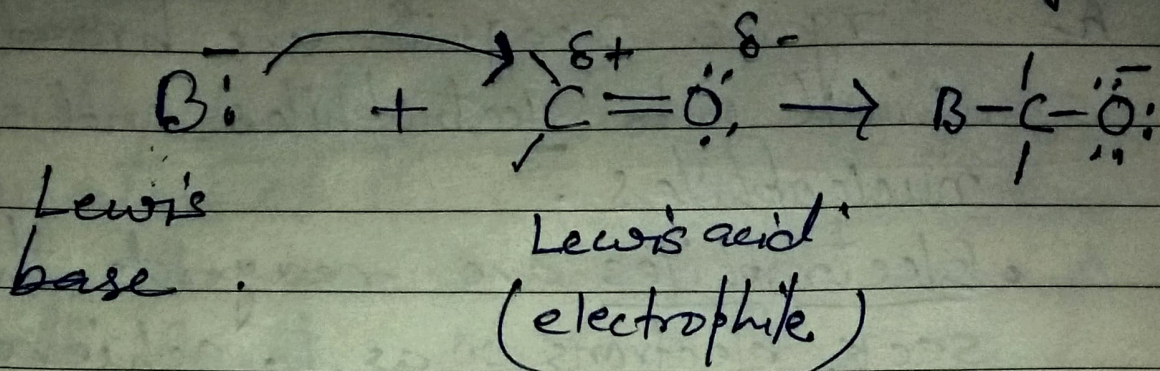
- Carbon atoms that are electron poor because of bond polarity, but are not carbocations, can also be electrophiles. They can react with the electron-rich centers of Lewis bases in



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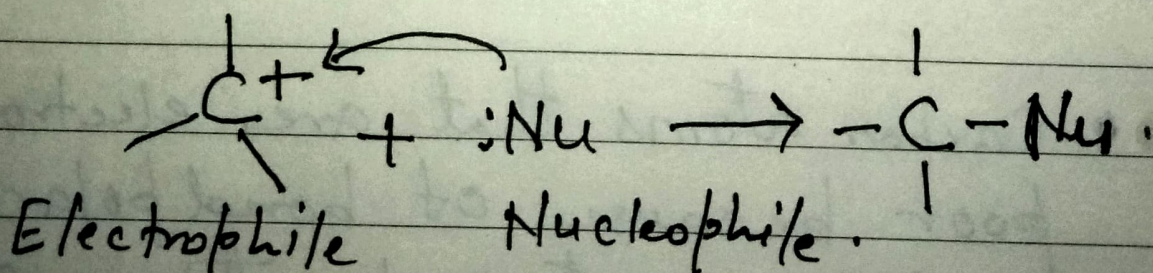
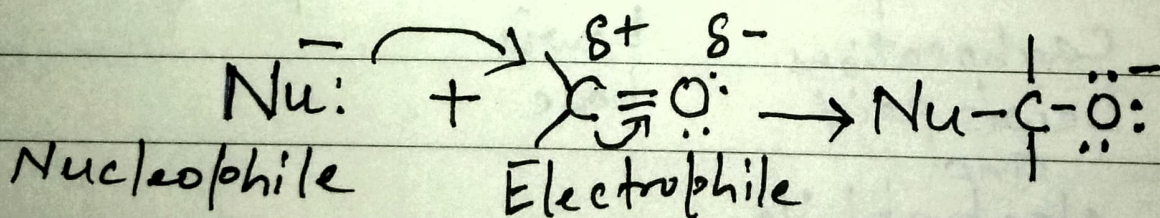
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reactions such as the following:



- A nucleophile is a Lewis base

that seeks a positive center such as a positively charged carbon atom. Nucleophile as nucleophilic reagents attack at the electron poor or deficient centre of the substrate.





Electrophiles	Nucleophiles
1. Electron rich	Electron poor.
2. Provide an electron pair	Accept an electron pair.
3. Lewis bases.	Lewis acids.
4. Often anions.	Often cations.
5. Examples: $\text{HO}^-$ , $\text{RO}^-$ , $\text{CN}^-$ , etc.	Examples: B: $\text{CH}_3^+$ , $\text{NO}_2^+$ , etc.

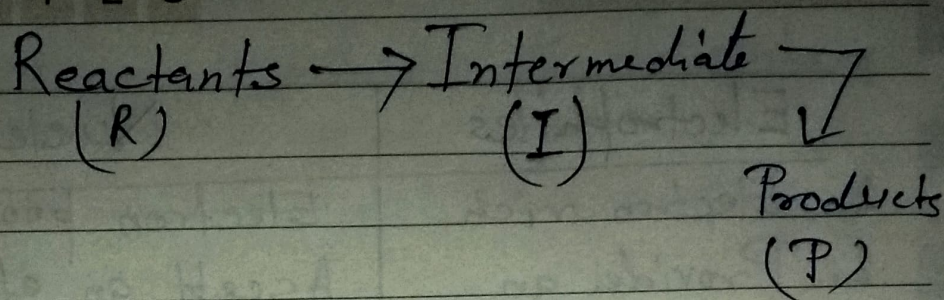
Q. What are Reaction intermediates?

A. Reaction intermediates:

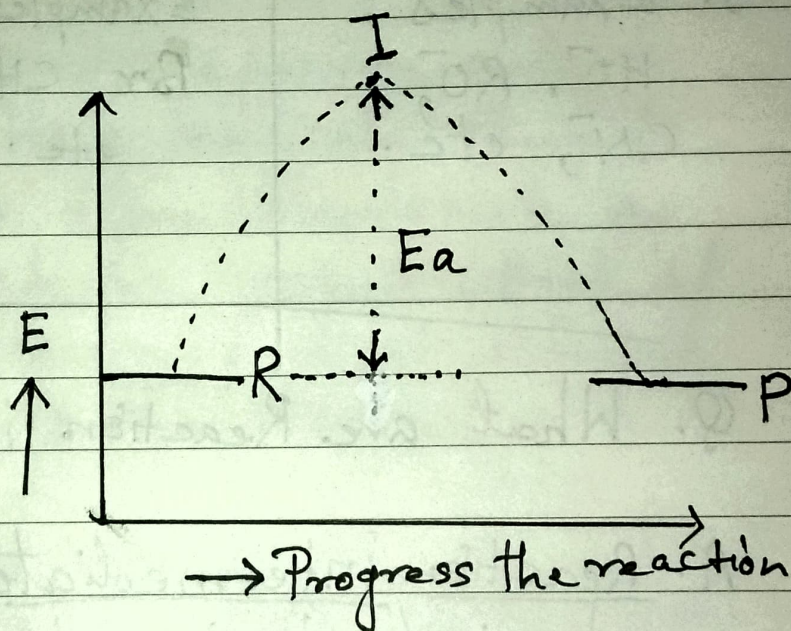
Chemical species which are formed between reactants and products of a chemical reaction are called reaction intermediates.

Actually, the reactants (R) first combine to form an intermediate and the intermediate then decomposes to form the products (P).





The potential energy diagram showing the energy of R, I and P is shown below:



When reactants combine, products are formed and this process is called a chemical reaction.

Starting materials of a chemical reaction are called reactants.

Reactants have some energy (internal energy). They acquire extra energy i.e.,



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activation energy ( $E_a$ ) to form an intermediate. This step is reversible, and constitutes a slow step or up-the-hill-step ( $R \rightleftharpoons I$ ). Now intermediate

decompose to form the product. This is irreversible, and constitutes a fast step called as down-the-valley-step ( $I \rightarrow P$ ). So, the

reaction intermediates have high higher energy, in comparison to both reactants and products. Due to high energy, these are unstable and thus highly reactive. Just like bubbles, their rate of formation is equal to their rate of decay.

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 References :

T. W. Graham Solomons  
 Craig B. Fryhle . and Bahl.