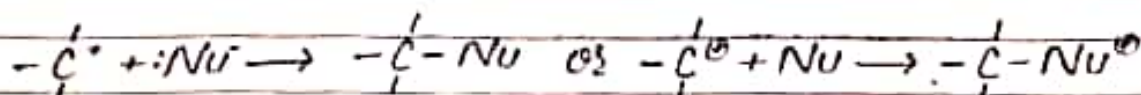


NUCLEOPHILES

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Nucleophiles or Nucleophilic reagents:

Nucleophiles are electron donating species. The name nucleophile means nucleus loving. Nucleophiles are electron rich, i.e., they normally possess unshared electron pairs which can donate either -ve or neutral mols. with free electron pairs. They attack regions of low electron density (+ve centres) in the substrate molecule.



Substrate Nucleophile Product

These are two types of nucleophiles:

(1) -vely charge nucleophiles: Those atom or molecule after receiving of two electrons complete the oct. called -vely charged nucleophiles.

e.g., Cl^- , Br^- , I^-

$\bar{N}H_2$, $R\bar{N}H$, $R=N^-$

R_3C^- , $CH_3COCH_2^-$, OH^-

OR^- , COO^- , $RCOO^-$, Carbanions.

(2) Neutral nucleophiles: Those atom or molecule which have lone pair of electron or more than one which is capable to donate the electron to substrate during the reaction known as neutral nucleophile.

e.g., $:NH_3$, $R-\overset{\cdot\cdot}{N}-H$, $H-\overset{\cdot\cdot}{O}-H$, $R-\overset{\cdot\cdot}{O}-H$, $R-\overset{\cdot\cdot}{O}-R$

$R-\overset{\cdot\cdot}{S}-H$, $H-\overset{\cdot\cdot}{S}-R$, $H-\overset{\cdot\cdot}{S}-H$, $R-\overset{\cdot\cdot}{N}-R$

$R-\overset{\cdot\cdot}{N}-R$, $R-\overset{\cdot\cdot}{Mg}X$, $R\overset{\cdot\cdot}{Li}$

The star (*) indicates the atom that donate electron to the substrate.

Since nucleophiles are capable of donating electron pairs they act as Lewis bases.

The reactions involving the attack of nucleophiles are known as nucleophilic reaction.