Carbene Encyclopedia Article

Carbene

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Carbene

A carbene has a general formula of R_2C:. Carbenes are one of the principle groups of reactive organic intermediaries and they are highly reactive due to the two unpaired electrons. Photolysis of a diazoalkane or a simple **elimination reaction** will produce a carbene. Dihalocarbenes such as Cl_2C: have the greatest synthetic value as they frequently act as intermediates in organic syntheses.

Carbenes can act as **electron** donors in chemical reactions. They are intermediates in such reactions as the change of a carboxylic acid to its next highest homologue or to a derivative of a homologous acid such as an ester or an amide. (A homologous series is a group of organic compounds that have the same **functional group** and a regular structural pattern so that a member of the series differs from the next member by a fixed number of atoms.) The reaction of a base with a trihalogen derivative of **methane** is an example of a commonly encountered reaction which proceeds via a carbene intermediate.

Carbenes are so reactive that they are unlikely to be frequently encountered. In any reaction of which they are a part, they rapidly move to the next stage of the synthesis. It is only in reactions with transition **metals** that carbenes are stable, due to the distribution of electrons within the structure formed.