Methyl Group Encyclopedia Article

Methyl Group

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Methyl Group

The methyl group is the **alkyl group** with the chemical formula -CH_3. The methyl group is sometimes abbreviated to -Me. The methyl group is derived from **methane**, CH_4. The methyl group, along with other alkyl groups is a modifier of the behavior of the **functional group** of the **molecule** in which it occurs. Characteristics such as melting point and **boiling point** generally increase with an increase in molecular **mass**. A methyl group has a low molecular mass and as such it has a minimal effect on the properties of other molecules of which it is attached to. To illustrate this point: if we consider the boiling points of the first three members of the carboxylic acid homologous series. Methanoic, or formic, acid (HCOOH) has a boiling point of 212°F (100°C), ethanoic, or acetic, acid (CH_3COOH) has a boiling point of 244°F (118°C), and propanoic acid (CH_3CH_2COOH) has a boiling point of 286° F (141°C).

The methyl carbocation, CH_3^+ is the least stable carbocation.

The addition of a methyl group to a compound is known as methylation. In aliphatic **chemistry** this is carried out as a substitution of a **hydrogen atom** in a group. In aromatic chemistry it may involve the substitution of one of the hydrogen atoms in the **ring** structure, this can be carried out using the Friedel-Crafts reaction.

Methylation is an important reaction in biology. DNA methylation, for example, is an important method for the regulation of gene transcription. Disorders in these methylation pathways, especially relating to the two vitamins (folic acid and S-adenosylmethionine) are associated with human disease. Inadequate dietary folic acid during pregnancy, for example, may increase the risk of birth defects.