

STEREOCHEMISTRY

1.

Lecture-14, Deg-II (H)

Paper -IV, Ch-4, 17 AUG. 2020

Topic :- Conformational Isomerism

Conformation

* Earlier it was believed that there was a free rotation about a single bond. But in 1936, Kemp and Pfitzer defined the above statement and suggested that there was restricted rotation about the single bond.

The restricted rotation led to the existence of a single compound of one configuration into more than one spatial arrangements. (conformations).

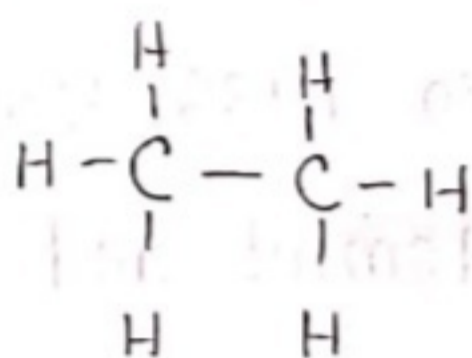
So now, conformation may be defined as the term used to denote any one of the infinite number of spatial arrangement of the atoms of a molecule that can arise from rotation about a single bond.

The term conformation should not be confused with the configuration which relates to those spatial

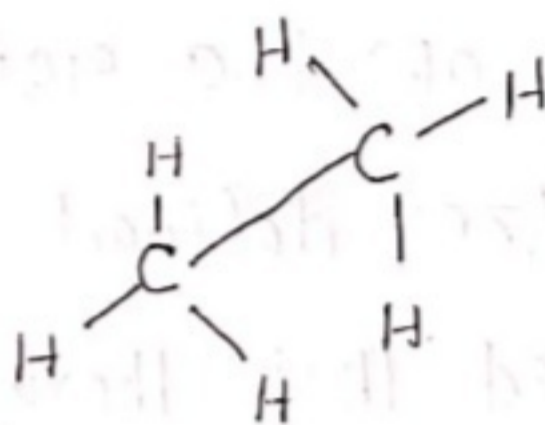
arrangements of the atoms of a molecule that can be changed only by the breaking and making of bonds whereas the spatial arrangements in conformation are changed simply by rotation about a single bond.

Conformation of Ethane

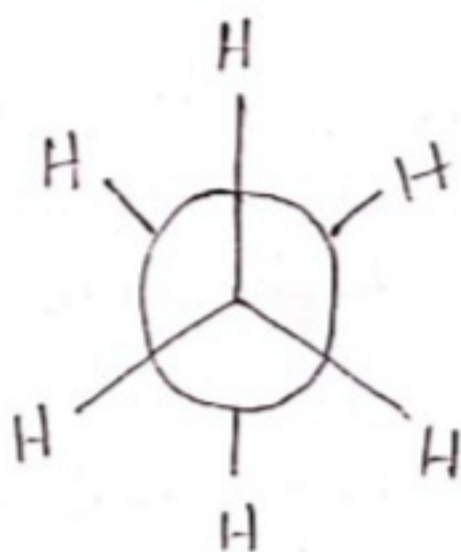
C_2H_6 (Ethane)



Planar Projection



Perspective Projection



Newmann Projection

* Out of these, the Newmann projection formulae are generally considered to be the best since the eclipsing of hydrogen atom can best be represented by this formula.

In the Newmann projection formula, the carbon atoms nearer to the eye and the groups attached to it are represented by equally spaced radii and the distant carbon atom and the groups attached to it are represented by a circle with three equally spaced extensions.

Now let us study the various possible conformations of ethane.

If one of the methyl groups is allowed to rotate along the C-C axis keeping the rest of molecule undisturbed an infinite number of possible arrangements of the rotated methyl group with respect to the undisturbed methyl group is generated, each of these possible arrangement represents a conformation.

To be continued in next lecture.....

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