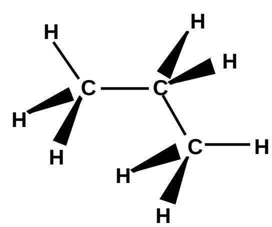
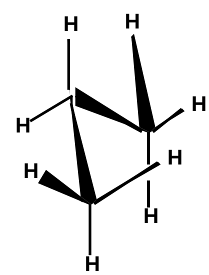
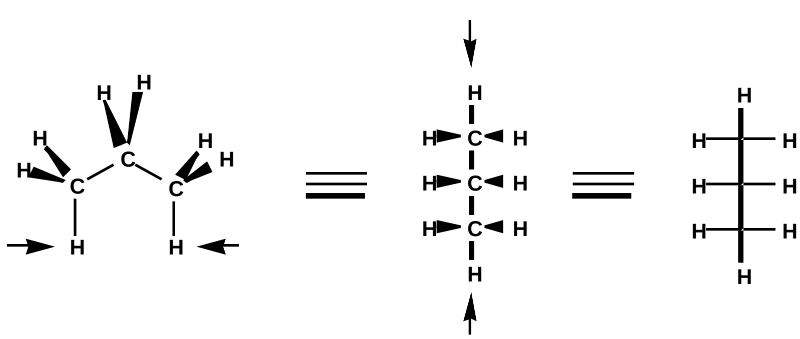
Text Related to Segment 2.02 ©2002 Claude E. Wintner

Continuing in the variation of molecular formula, we examine propane. Now there are *two* carbon-carbon bonds about which the conformation may vary, so that the problem of representation of any single conformation in two dimensions becomes significantly greater. Reference to a molecular model will clarify the following two representations of the all-staggered conformer of propane.





The considerably less stable all-eclipsed conformation of propane is shown below. Again, examination of a model, and keeping track of the hydrogen atoms marked in the figure by arrows, will facilitate a grasp of the transformation as a result of which this conformation can be represented using a Fischer projection formula. As before in this projection, the hydrogen atoms on the horizontal bonds are to be interpreted as being closer to the observer than the carbon atoms to which they are attached, while the vertical axis should be visualized as a flattened out perspective representation of a horseshoe, the ends of the horseshoe being farther from the observer than the center.



Again the issue of population must be emphasized. Given that the all-eclipsed conformation of propane suffers from two simultaneous eclipsed interactions, we can infer that in a sample of propane at room temperature the population of the all-staggered conformer relative to the all-eclipsed form should be on the order of $10^2 \times 10^2 = 10^4$ to 1, with the result that the all-eclipsed form should have no effective influence on the properties of the molecule.