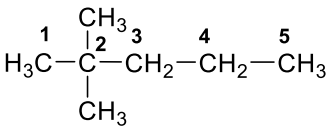
Tutorial 4

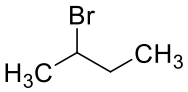
Q1. Write Newman projections for all three staggered conformations of 2,2-dimethylpentane, looking down the C3-C4 bond. Select the most stable conformation.



2,2-dimethylpentane

Q2. For 2,2-dimethylpentane, write one Newman projection looking down the C2-C3 bond. Explain why the view down the C3-C4 bond (in the question above) is more informative in identifying the best conformation.

Q3. Consider 2-bromobutane (shown). Sighting along the C2-C3 bond and using Newman projections, answer the following questions using the data provided in the table below.



Interaction	kcal·mol^{-1}
H,H eclipsed	1.0
H,CH_3 eclipsed	1.4
CH_3,CH_3 eclipsed	2.6
H,Br eclipsed	1.7
CH_3,Br gauche	0.9
CH_3,CH_3 gauche	0.9
CH_3,Br eclipsed	3.8

a. Draw the most stable conformer and calculate the total interaction energy.
b. Draw the least stable conformer and calculate the total interaction energy.

Q4. Consider the molecule 1,2-dichloroethane and answer the following questions.

(a) Draw Newman projections for all eclipsed conformations formed by rotation from 0° to 360° about the C-C bond.
(b) Which eclipsed conformation(s) has the lowest energy? Which will have the highest energy?