

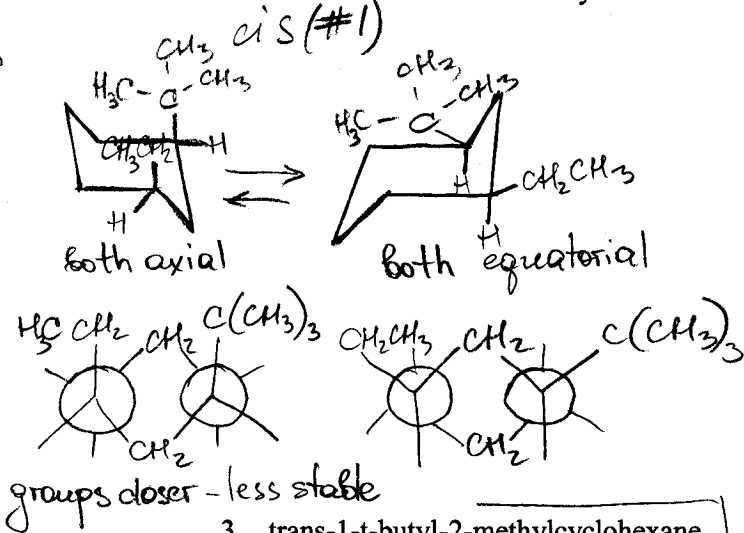
For this lab you should have remembered from the lectures the following fact:

Groups larger than hydrogen such as the methyl group experience more **non-bonded interaction strain** (atom crunching) in the axial position (1,3-diaxial interactions) than in the equatorial position. As a result, the chair with the methyl group equatorial predominates at equilibrium. The larger the group, the greater its preference for being equatorial. If you have 2 groups, they both prefer to be in equatorial. If it is not possible, then the largest group prefers to be in equatorial and the smallest in the axial position.

Draw the two chair conformations for each compound (i.e., do ringflips for each molecule), label the substituents as axial or equatorial, then state which conformation—before and after ringflip—is more stable. Make the molecules with your model kits to prove your answer.

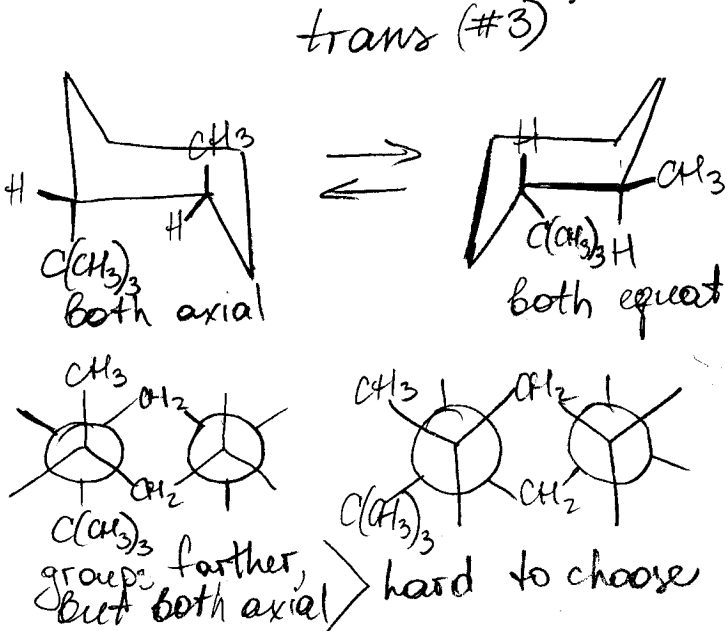
- cis-1-t-butyl-3-ethylcyclohexane
- trans-1-t-butyl-3-ethylcyclohexane

Which is more stable--1 or 2? Why?

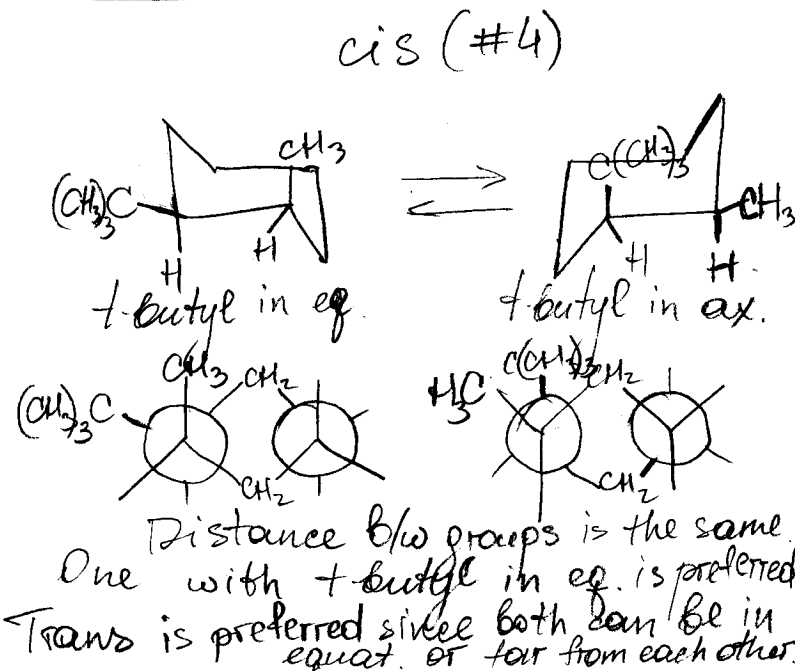
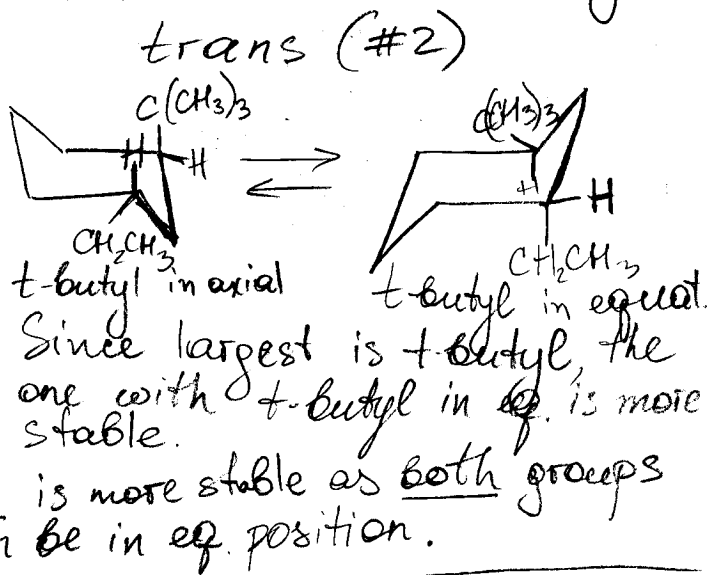


- trans-1-t-butyl-2-methylcyclohexane
- cis-1-t-butyl-2-methylcyclohexane

Which is more stable—3 or 4? Why?



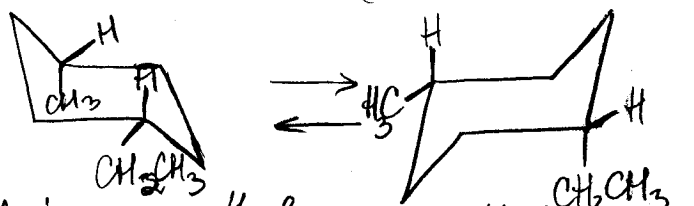
I will omit H-atoms on most carbon atoms for clarity



5. cis-1-ethyl-4-methylcyclohexane
6. trans-1-ethyl-4-methylcyclohexane

Which is more stable—5 or 6? Why?

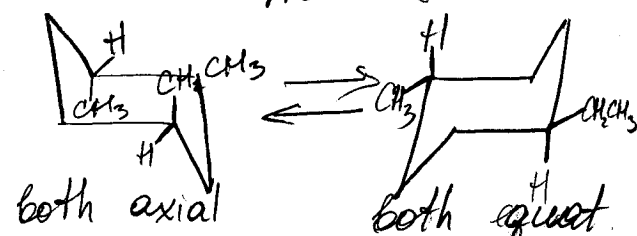
cis (#5)



*Ethyl in eq, methyl in ax.
Ethyl is larger, 1st is more stable.*

Ethyl in ax, Methyl in eq.

trans (#6)

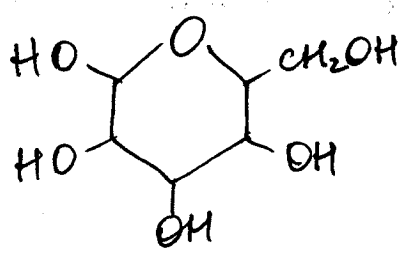


both axial

both equat. more stable

Trans is more stable as both groups can be equat.

Draw the most stable conformation of glucose in the chair conformation.



Each group can be at either eq or ax position. There are many possibilities. However, since the most stable orientation for each substituent would be the equatorial, then the most stable form will be the one with ALL groups in equatorial position:

