

January 2014

D53044

1. Whereas the trans isomer of 1,2-dimethylcyclohexane is more stable than its cis isomer, the cis-1,3-dimethylcyclohexane is more stable than its trans isomer. Explain why?
2. Write a note on the conformations of
a) Decalins and b) lactose.

February 2013

D 34019

1. Why are t-butylcyclohexane derivatives called conformationally biased cyclohexanes?
2. Briefly discuss the conformation of decalins.
3. What are conformationally biased systems? Write two examples of such systems. Show how these are useful in understanding the reactivity of axial and equatorial groups. Illustrate with examples.

February 2013

D 33395

1. Between trans-1,2-dimethylcyclohexane and cis-1,2-dimethylcyclohexane which is more stable and why?
2. Discuss the conformational stability of disubstituted cyclohexanes and cis and trans decalins.

3. Discuss the conformation of 2-bromocyclohexanone, cis and trans-2,6-dibromocyclohexanones and 2-bromo-4,4-dimethylcyclohexanones.

November 2010

D 9371

1. A 1,3 methyl/methyl diaxial interaction has been estimated to be approximately 3.7 kcal/mole destabilizing. This is significantly more than the 0.9 kcal/mole associated with a 1,3 hydrogen/methyl diaxial interaction. Use these values to calculate the energy difference between two chair conformations of cis-1,3-dimethylcyclohexane.
2. Explain Briefly why 1-methyl-1-phenylcyclohexane slightly favours a conformation that places the bulkier phenyl group in the axial position rather than the smaller methyl group.



$$\Delta G^\circ = -0.32 \text{ kcal/mol.}$$

3. Discuss the effects of hydrogen bonding on boiling point, acidity, basicity and stability of conformational isomers

November 2009

D 2035

1. Draw the most stable conformers of ethylene glycol with explanation

2. Explain with suitable examples how dipolar repulsions and H-bonding influence the stability of conformers 1,2-; 1,3-; and 1,4-disubstituted cyclohexanes.

January 2011

D 10862.

1. Draw the possible conformations of n-butane.
2. Draw the conformations of cis and trans decalins.
3. Discuss the conformations of lactose, ~~and~~ glycols, sucrose and adamantane.

January 2012

D 22456

1. What is angle strain?
2. cis-1,3 di-t-butylcyclohexene exist in chair form and its trans isomer will not. Why?
3. Describe the conformations of sucrose.

January 2012

D 22925.

1. Why is gauche conformation preferred over anti in case of n-propyl chloride.
2. meso-2,3-dibromobutane exists predominantly in anti form. Why?
3. Discuss the conformational analysis of various disubstituted cyclohexanes.

December 2009

D 2035 A.

1. Explain with an example, what is a conformationally biased cyclohexane. How can such a compound be used to study the reactivity in cyclohexane derivatives?
2. Discuss the conformers of 2-chlorocyclohexanone.

3. ~~Explain~~

January 2007

D 28070

1. The chair form of cis-1-chloro-2-methylcyclohexane does not have a superimposable mirror image. Nevertheless, the compound in solution is optically inactive. Why?

January 2007

D 21897

1. Draw the conformational energy diagram of n-butane.

January 2006

D 12479

1. Discuss conformational aspects of cycloheptane.
2. What are different stable conformational structures for 1,2; 1,3; 1,4-dimethylcyclohexanes. Identify gauche interaction present in each one.

January 2006

D 12684.

1. What are conformationally biased systems? Write an example of cyclohexane conformers which is biased.

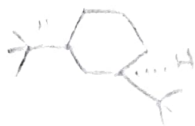
January 2005

D 2652.

1. Write all the possible stereoisomers of 1,2-dimethylcyclohexane. Draw their most stable conformations.
2. Explain why in the preferred conformation of acetal A the t-butyl group is axial and methyl is equatorial.



3. Explain why trans 1,3-di-t butyl cyclohexane D prefers chair conformation.



4. How many ^{more} gauche interactions are present in cis-1,2-dimethylcyclohexane compared to cyclohexane.
5. Draw conformational structure for cis-decalin.
6. Draw the most stable conformation of 2-phenylpropanol.

April 2004

C 35875

1. Write stable conformation of cis-1,4-dimethylcyclohexane.
2. Write Newman projection formula for the stable conformation of 2-chloroethanol.
3. Explain conformational effects in 2-chlorocyclohexanone.

April 2003

C 26222.

1. Which one of the two compounds, trans-1-chloro-4-methylcyclohexane or cis-1-*t*-butyl-4-fluorocyclohexane could be more likely to undergo conformational transformation between two chair forms. Why?
2. Explain the influence of conformation on the reactivity of cyclohexane derivatives.

April 2000

C 1722.

1. Boat form of cyclohexane is less stable than chair form. Why?
2. How many conformers are possible for 1,2-dibromoethane? Which is more stable and why?
3. Explain the relationship between conformation and reactivity in cyclohexyl systems with examples.

April 2000

C 1584

1. Draw the preferred conformations of meso and 1,2-dichloro-1,2-diphenyl ethanes and predict which will have a higher dipole moment.
2. Draw the stable conformations of cis and trans 4-t-butylcyclohexanes.

March 1998

C 1989

1. Discuss the stability of 1-chloro-2-methylcyclohexanes
2. Discuss why cis-decalin is called a conformationally mobile system whereas the trans isomer is not.

February 2003

D 24095.

1. Explain why cis-1,3-dimethyl cyclohexane is more stable than its trans isomer although trans-1,2-dimethyl cyclohexane is more stable than cis isomer.
2. Draw the conformations of cis and trans decalin. Which is the mobile one? Why?

December 2003

D 31259

1. Give the preferred conformations of the following and justify
 - (a) trans-1,3-di t-butyl cyclohexane.
 - (b) cis-1,3-cyclohexane diol.

2. Why is cis-1,3-dimethylcyclohexane more stable than its trans isomer.
3. Explain the conformations of cis and trans decalins and their monosubstituted derivatives.

February 2002

D 18072.

1. Show the preferred conformations of cis-1,4-di-t-butylcyclohexane and 2-bromocyclohexanone. Give reasons for your answers.
2. What are the factors that contribute to the greater stability of chair conformation for cyclohexane?

March 2002

C 19163.

1. Why is chair conformation of cyclohexane more stable than the boat conformation?
2. 1,2-Dibromoethane shows a dipole moment of 1.0 D at room temperature. Comment on its conformation.
3. Briefly explain the conformational stability of cis and trans decalins.
4. Discuss the conformations of cyclopentane and its derivatives.
5. Discuss the conformations and the relative stabilities of cis and trans 1,2,3 and 1,4-dimethylcyclohexanes.

April 2002

C 19159

1. Three stereoisomers are possible for 1,2-dimethylcyclopentane. Depict their conformations and identify those which are optically active.
2. Analyse the stereoisomerism, isomer stability and optical activity of all possible chair conformers of 1-t-butyl-2-methylcyclohexane.

March 2001

C 12962.

1. Draw the most stable conformers of 2-fluoroethanol and ethyl cis-4-t-butyl-cyclohexane-1-carboxylate.

April 2001

C 12958.

1. Predict the preferred conformations of the following giving reasons:
 - (a) cis-cyclohexane-1,3-diol
 - (b) trans-1,3-di-t-butylcyclohexane.

April 2001

C 12819

1. The preferred conformation of 2-chlorocyclohexanone in CCl_4 has chlorine in the axial orientation. Why?
2. (a) Explain the ring inversion process in cyclohexane with special reference to the energetics.
(b) Discuss the conformations of 9-methyldecalin.

April

March 1997

C 31108

1. Explain the envelope and half chair conformation of cyclopentane.

March 1996

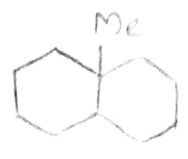
C 26409

1. Draw the conformations of trans-1,2-dibromocyclohexane and compare their stability.
2. Account for the observation that cyclobutane is not planar even though the bond angle in the non-planar conformation is less than that in the planar conformation.
3. Draw the stable conformations of cis- and trans-4-*t*-butylcyclohexane-carboxylic acid. Which one is the stronger acid. Why?
4. Draw the conformations of two trans-decalin-2-ol isomers.

April 1995

18112

1. What is conformational analysis? Mention the different methods used for the same.
2. Draw the preferred conformations of the diastereomers of



3. Estimate the energy difference between conformations possible for 1,3-Dimethylcyclohexane.
4. Explain the conformational analysis of cycloalkanes $(CH_2)_n$ for $n = 4, 5$ and 6

April 1995

C 17983

1. Draw the conformational equilibrium for *trans*-1,2-dimethylcyclohexane and estimate the energy difference between the conformers.
2. Draw the Newman projections of the preferred conformations of D and meso-tartaric acids.
3. Explain the meaning of dihedral angle and n-Butane gauche interaction.
4. Explain conformational analysis of decalins and their monosubstituted derivatives.

March 1994

1. It has been found that *trans*-1,2-dichlorocyclohexane exists in the gaseous phase, mainly in the diaxial conformation. Why?
2. Cyclobutane and cyclopentane have nonplanar conformations. Explain.

April 1993

C 6045

1. Draw the two conformations of *cis*-decalin-2-one.
2. a) Draw the conformations of *cis* and *trans* isomers of 1-methyl-2-methyl and 3-methylcyclohexanols. Compare stability.
b) Draw the conformations of *cis* and *trans* 2-methylcyclohexylchloride.
c) Draw the conformations of *cis* and *trans* 4-*t*-butylcyclohexane carboxylic acid and which is the strongest acid.

March 1993

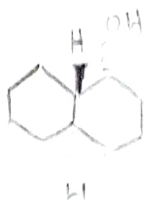
C 5938

- Draw the stablest conformations of the following molecules, explain their stability.
 - trans-1,2-dibromocyclohexane.
 - cis-1,3-dibromocyclohexane.
- Draw the conformations in Newman projection, of the two diastereomers of 1,2-dibromo-1,2-diphenylethane. Show:
 - which has higher dipole moment, why?
- Draw the conformations of 2-axial-hydroxy-trans-decalin and its ^{2'} equatorial isomer.
- Draw the conformations of
 - cis and trans-4-t-butylcyclohexyl chloride.
 - cis and trans isomers of 1,2-1,3-1,4 dimethylcyclohexane
 - Isomeric 2-methyldecalins.

May 1991

C-5762

- Draw the two chair conformations of the following molecule. Which one is stablest?



May 1990

C 1637

- Draw the conformations of cis and trans-2-methylcyclohexanol. Which is stablest?
- Suggest a method to distinguish cis and trans isomers of cyclopropane-1,2-dicarboxylic acid.