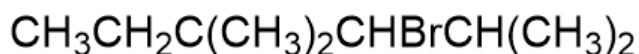




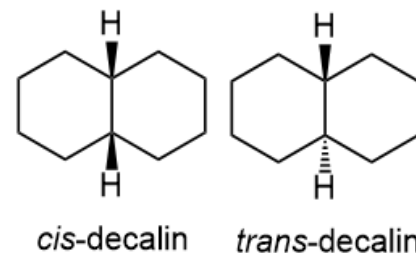
- 1 Provide a drawing for the following name:
(1,1-dimethylethyl)cyclobutane

- 2 Provide an IUPAC name for the given compound:

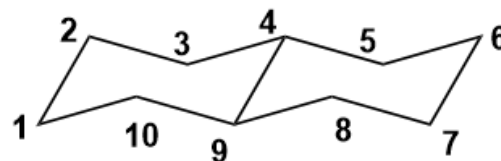


- 3 **Group work:** Decalin is composed of two fused cyclohexane rings.

- 1) Draw all of the missing hydrogen atoms on the numbered decalin framework shown. (Start by adding the axial hydrogens.)
- 2) Identify whether each of the following substituents would be in an equatorial (eq.) or axial (ax.) position.
- 3) Is the numbered drawing *cis*- or *trans*-decalin? Explain.



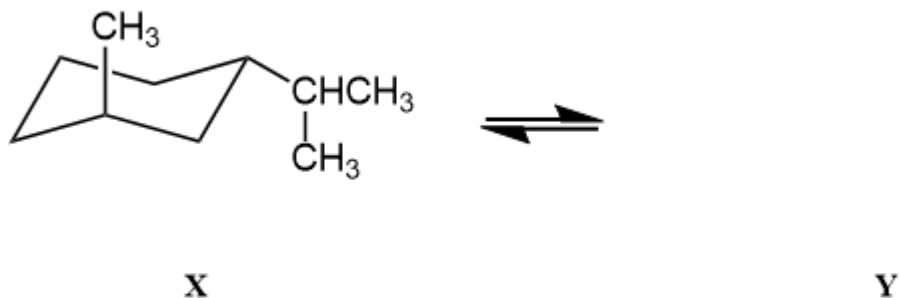
- a) A group at the C-3 position pointing UP. _____
- b) A group at the C-7 position pointing DOWN. _____
- c) A group at the C-2 position pointing UP. _____
- d) A group at the C-9 position pointing DOWN. _____
- e) A group at the C-10 position pointing DOWN. _____
- f) A group at the C-1 position pointing UP. _____



cis or *trans* decalin?

see *SkillBuilders* 4.9, 4.10

- 4 Shown below is a chair conformation of a substituted cyclohexane (**X**). Perform a "chair flip" to draw the other chair conformation (**Y**).



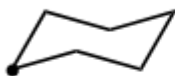
5 Is **X** the cis or trans isomer?

Is **Y** the cis or trans isomer?

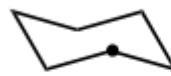
6 Which conformer (**X**, **Y** or neither) predominates at equilibrium? Explain.

- 7 Draw the **most stable chair conformation** of each of the following compounds, using the marked carbon atom as position #1 in each case. Which isomer is the most thermodynamically stable?

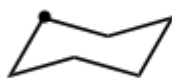
A) *cis*-1,4-dimethylcyclohexane



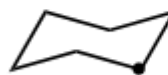
B) *trans*-1,4-dimethylcyclohexane



C) 1,1-dimethylcyclohexane



D) *cis*-1,2-dimethylcyclohexane



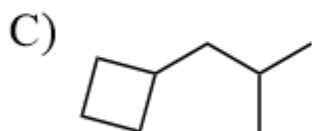
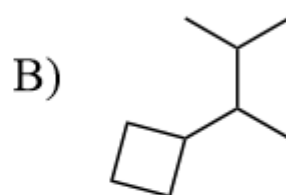
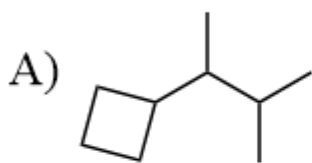
E) *trans*-1,3-dimethylcyclohexane



1

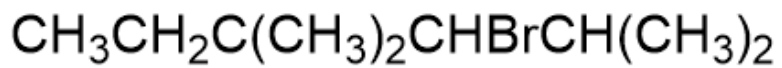
Provide a drawing for the following name:

(1,1-dimethylethyl)cyclobutane



2

Which is the correct IUPAC name for the given compound?



A) 4-bromo-3,3,5-trimethylhexane

B) 3-bromo-2,4,4-trimethylhexane

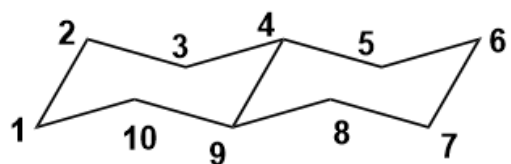
C) 2-bromo-1,1,3,3-tetramethylpentane

D) 4-bromo-3,3,5,5-tetramethylpentane

E) 1-bromo-1-isopropyl-2,2-dimethylbutane

3

- a) A group at the C-3 position pointing UP. _____
- b) A group at the C-7 position pointing DOWN. _____
- c) A group at the C-2 position pointing UP. _____
- d) A group at the C-9 position pointing DOWN. _____
- e) A group at the C-10 position pointing DOWN. _____
- f) A group at the C-1 position pointing UP. _____

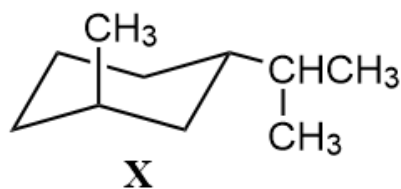


cis or *trans* decalin?

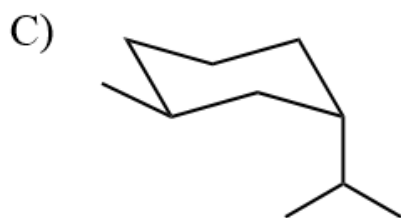
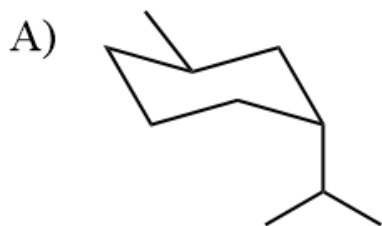
see **SkillBuilders 4.9, 4.10**

4

Shown below is a chair conformation of a substituted cyclohexane (**X**). Identify the other chair conformation (**Y**).

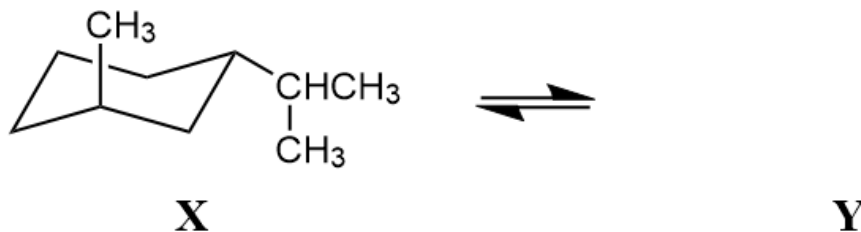


Y



5

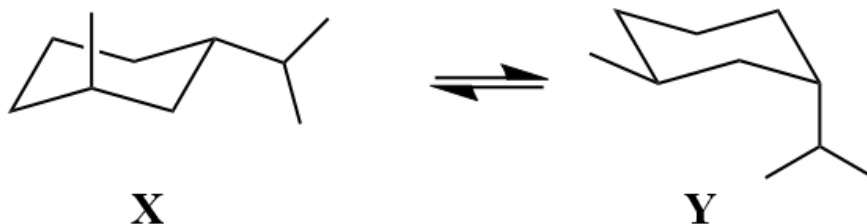
Is compound **X** a cis or trans isomer? Consider the other chair conformation (**Y**) and answer the same question.



- A) **X** and **Y** are both cis.
 B) **X** and **Y** are both trans.
 C) **X** is cis, but **Y** is trans.
 D) **X** is trans, but **Y** is cis.

6

Which chair conformation (**X** or **Y** or neither) predominates at equilibrium? Explain briefly.



- A) **Y** is favored, because the substituents are farther apart.
 B) **Y** is favored, because the larger group is axial.
 C) Neither is favored, because both have one eq. and one ax. group.
 D) **X** is favored, because the larger group is equatorial.
 E) **X** is favored, because it has greater 1,3-diaxial interactions.