Week 5 Worksheet

Topics Covered:

- Chair conformations
  - Drawing chair flips
  - Identifying equatorial and axial substituents
  - Understanding conformations and stability
- Intro to stereoisomers
  - Assigning priority of substituents
  - Identifying R or S configuration

1. Answer the following questions about the molecule below. (Smith, 6th edition, Question 4.55)

   ![Molecule Image]

   a. Draw representations of cis and trans isomers using a hexagon for the six
      membered ring, wedges and dashes for the substituents.

   b. Draw the two possible chair conformations for the cis isomer. Which
      conformation, if either, is more stable?
c. Draw the two possible chair conformations for the trans isomer. Which conformation, if either, is more stable?

d. Which isomer, cis or trans, is more stable?

2. Convert each of the following structures to its more stable chair form. One structure represents menthol and the other represents isomenthol. Menthol is the more stable isomer. Which structure corresponds to menthol? (Smith, 6th edition, Question 4.56)
3. Draw a second chair conformation for each cyclohexane. Then decide which conformation is present in higher concentrations at equilibrium. (Smith, 6th edition, Question 4.23)

a. 

![Chemistry Structure](attachment:structure_a.png)

b. 

![Chemistry Structure](attachment:structure_b.png)

c. 

![Chemistry Structure](attachment:structure_c.png)
4. Label each of the stereocenters as R or S. (Smith, 6th edition, Question 5.50)

a.

![Image](https://i.imgur.com/3Q5Q5Q5.png)

b.

![Image](https://i.imgur.com/3Q5Q5Q5.png)

c.

![Image](https://i.imgur.com/3Q5Q5Q5.png)

5. Determine which of the substituents in each pair has the higher priority. (Smith, 6th edition, Question 5.13)

a. \(- CH_3, - CH_2CH_3\)

b. \(- I, - Br\)

c. \(- CH_2CH_2Br, - CH_2Br\)

d. \(- CH_2CH_2Cl, - CH_2CH(CH_3)_2\)
6. Locate all of the stereocenters in this molecule. (Smith, 6th edition, Question 5.11)