Week 5 Worksheet

Key Concepts

- When drawing chairs, be sure to stay consistent when numbering carbons. If you count clockwise on the ring, count clockwise on the chair
- Use model kits when making Newman projections
- Stable = Farther apart for Newman projections. You want to minimize interactions between substituents
- Cis = same side
- Trans = Opposite side
- Remember that you can rotate Newman projections. You can use that to your advantage when trying to draw structures that are more stable.
- Recall nomenclature rules
  - Find the parent by counting the longest chain. Number the substituents in alphabetical order.

1. Convert each three-dimensional model to a Newman projection around the indicated bond. Red atom corresponds to Br, green atom corresponds to Cl, black atom corresponds to C, and white atom corresponds to H.

Figure adapted from Janice Gorzynski Smith’s Organic Chemistry 3rd edition
2. Considering rotation around the indicated bond in each compound, draw Newman projections for the most stable and least stable conformations.

   a. 
   \[ \text{CH}_3 \quad \text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3 \]

   b. 
   \[ \text{CH}_3\text{CH}_2\text{CH}_2 \quad \text{CH}_2\text{CH}_2\text{CH}_3 \]

3. Give the IUPAC name for each compound.

4. Draw the two possible chair conformations for cis-1,3-dimethylcyclohexane. Which conformation, if either, is more stable?
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5. Which of the given 1,3,5-trimethylcyclohexane isomers is more stable? Explain your choice.

6. Convert each of the following structures into its more stable chair form. One structure represents menthol and one represents isomenthol. Menthol, the more stable isomer, is used in lip balms and mouthwash. Which structure corresponds to menthol?