

Chem 51A – SSI 2013

Discussion 5 Worksheet

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This worksheet will focus on concepts to be discussed or already discussed, in Chapter 4. Those concepts being 1) Alkanes and Naming 2) 3-D Glasses (i.e. Newman Projections and Chair Flips).

1. Based on the names below, how many carbons are present in each molecule? (These need to be memorized!)

Octane

Propane

Hexane

Methane

Ethane

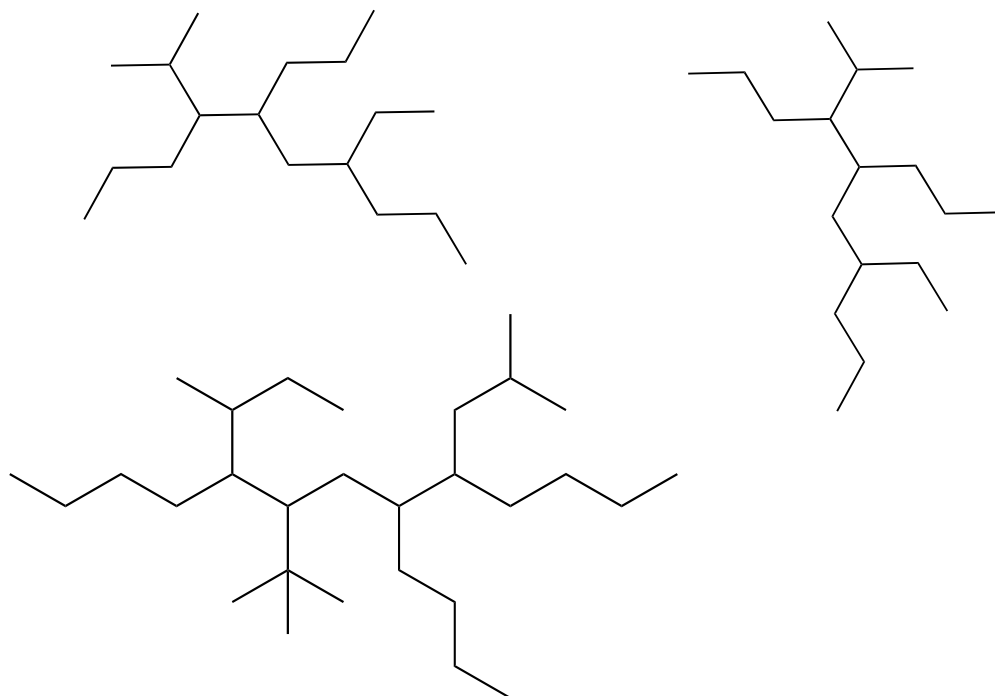
Pentane

Butane

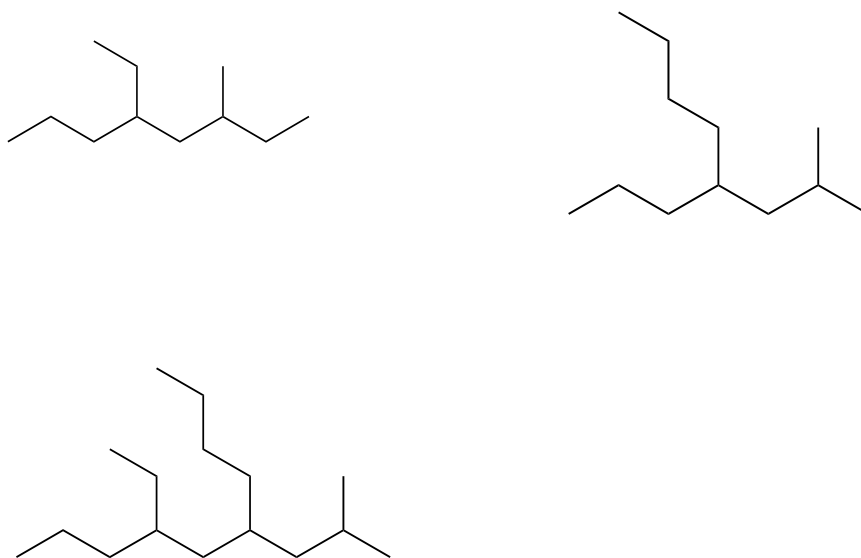
Isobutane

2. As the number of carbons increase, the number of **constitutional isomers** that can be made using those carbons also increases. Draw all of the constitutional isomers of the compound with the molecular formula C_6H_{14} .

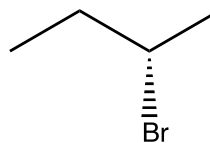
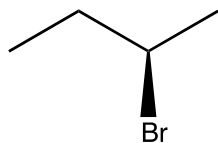
3. Nomenclature, or naming, of organic compounds begins by identifying the **longest linear** chain of carbons within a compound. Once the longest linear chain has been identified, the next step to alkane nomenclature is identifying the substituents present on the molecule. In each of the below structures, identify the longest linear chain and identify all substituents.



4. Name each the structures below using correct IUPAC nomenclature.

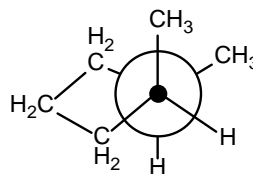
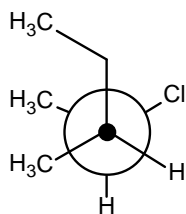
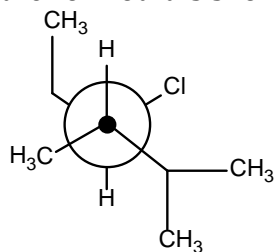


5. Translate the below structures into a Newman Projection by looking down the C₂-C₃ bond.



- a. Can you rotate the Newman Projection on the left to be the Newman Projection on the right?

6. Convert the Newman projections below into skeletal drawings with appropriate dashes and wedges. For each of the Newman projects, label whether or not it is shown in the low energy conformation.



7. For each of the cyclohexanes below, draw the chair-flipped conformation. Which of the two chairs is more stable? Also draw the flat (skeletal) structures. For practice, can you also draw the boats? Can you draw the Newman projections down any one of the bonds? I know, I didn't leave you space.

