Worksheet 4: Newman Projections

Skill-Building Goals: Learn to interconvert between standard line-angle notation and Newman projections, and use these to predict relative conformational stabilization

1. Draw the following Newman Projections in all of their staggered and eclipsed conformations. Draw a representative energy diagram showing 360° rotation, ensuring relative energy barriers.
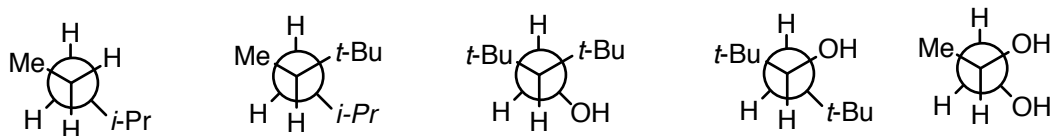
2. Convert the following into its' Newman projection, ensuring to replicate the correct configuration and stereochemistry.
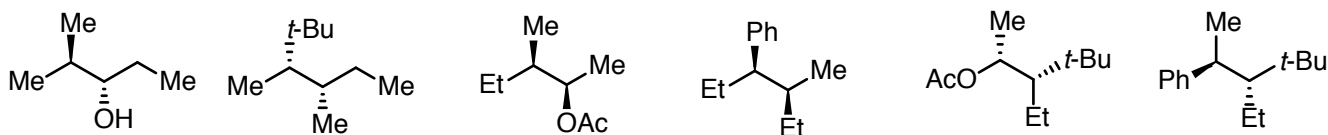
3. Take each Newman projection above and converted into the remaining high (eclipsed) and low (staggered) rotational barrier conformations.

4. Draw the HIGHEST energy Newman projection(s) from each series above into the line-angle notation that reflects the conformation.

5. Draw the highest LOWEST energy Newman projection(s) from each series above into the line-angle notation that reflects the conformation.

6. Chair conformations (which will be covered next) can be understood if one understands Newman projections. Take a look at the below Newman-type conformation, where two hydrogens are labeled Ha and Hb in the chair and Newman projections. (A) Try to map the remaining hydrogen atoms to one-another. (B) Draw a Newman projection-type diagram for each chair conformation in part B, and predict which is lower in energy based upon your knowledge of Newman projection energy stabilization.