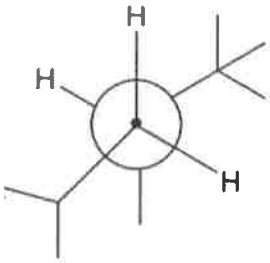
Alkanes #3: Newman Projection State of Mind

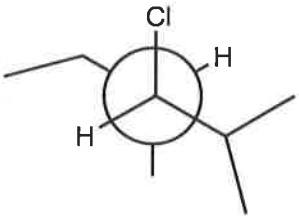
Alright gang, this worksheet is all about how to draw Newman Projections. Like we covered in the corresponding video, Newman Projections help us figure out the different configurations molecules take on and how they affect the overall energy of the molecule, depending on how the molecule's bonds are arranged. So let's get drawing.

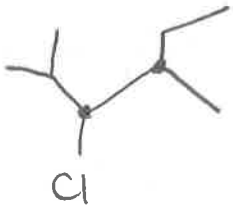
1.) Below are the Newman Projections of several molecules. Take that Newman Projection and convert it to the correct Bond Line structure.

i.)

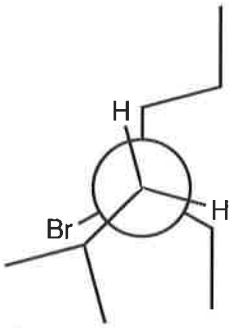


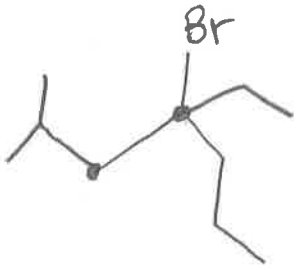
ii.)



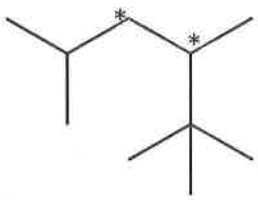


iii.)

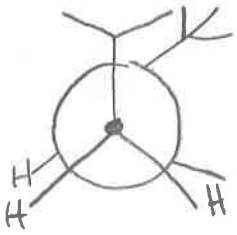


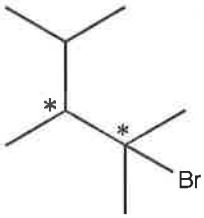


2.) Way to go team. Okay, time to switch it up: For each Bond Line Structure on the right, correctly convert them to the appropriate Newman Projection(s) with the asterisk carbons as the dot and circle carbons.

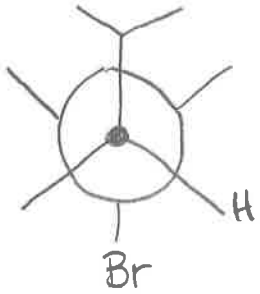


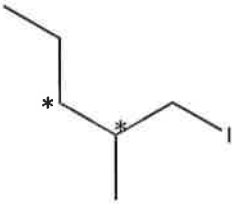
i.) Draw the highest energy conformation (eclipsed):



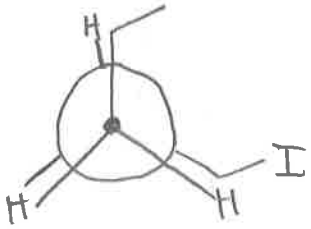


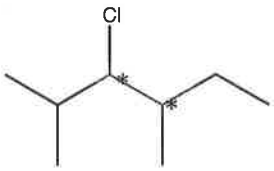
ii.) Draw the lowest energy conformation (anti):



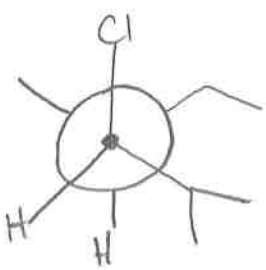


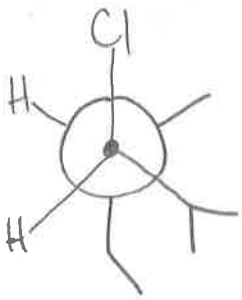
iii.) Draw the most stable eclipsed conformation:

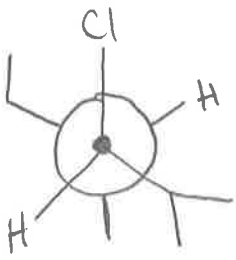




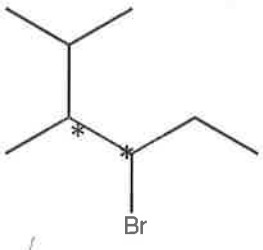
iv.) Draw the ***all*** of the staggered conformations:



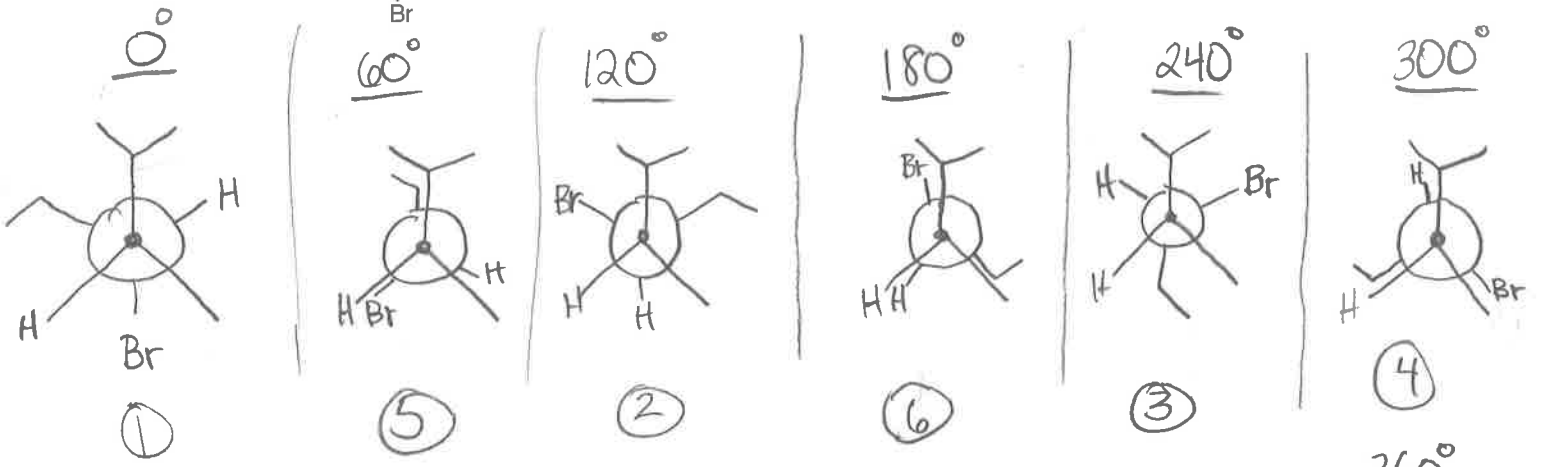




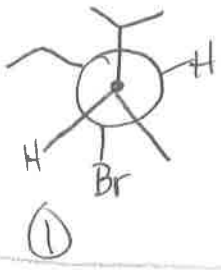
3.) Draw an energy diagram of the molecule below (using the asterisk carbons as your "dot" and "circle" carbons), rotating it between 0° and 360° in 60° increments. In your diagram, reflect the relative energy rankings between all of the conformations (like we did in the Newman Projection video).

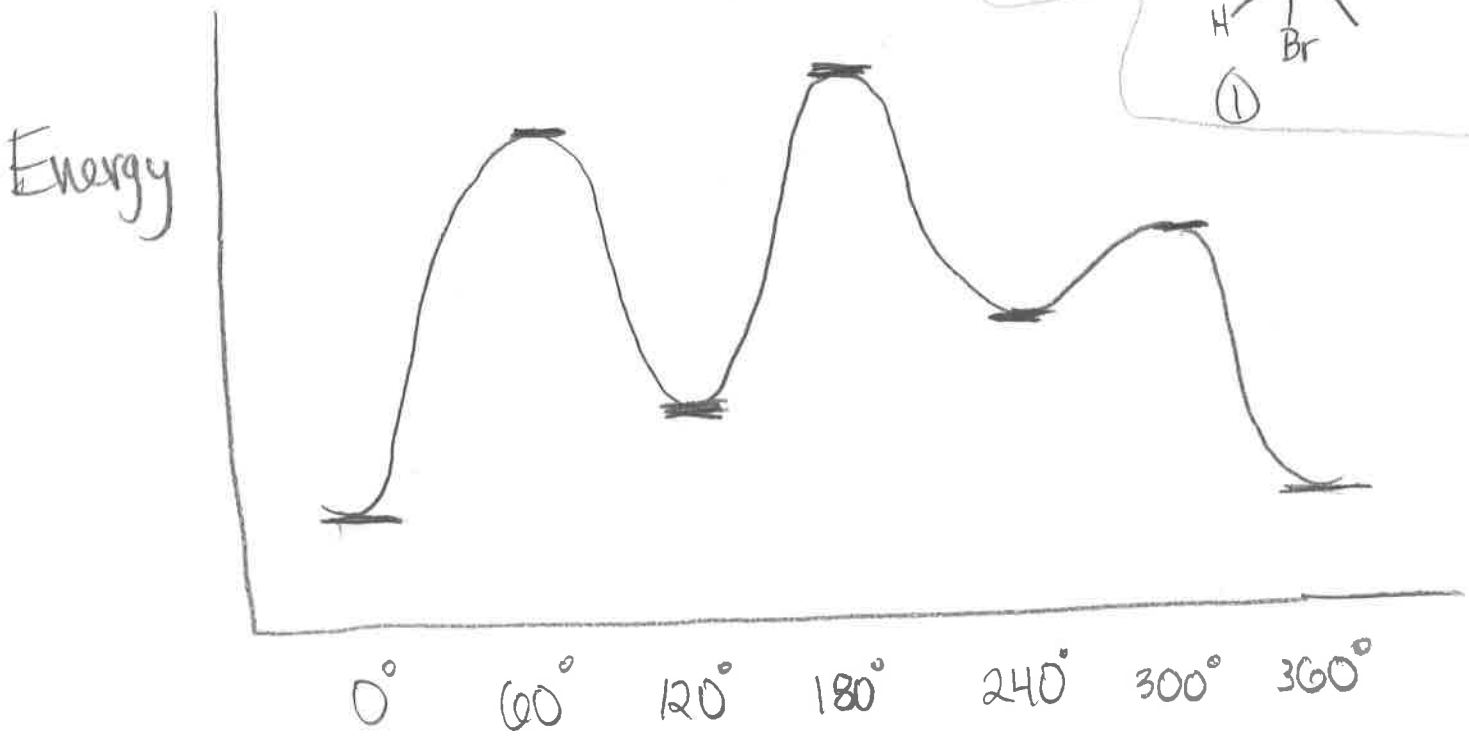


Rank 1–6, 1 being lowest Energy

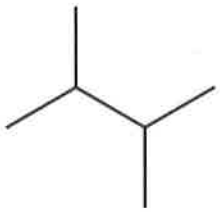


360° (same as 0°)





4.) Alright, that's enough Newman Projections. Below, rank the 3 alkane molecules in increasing boiling point fashion (the structure receiving 3 would have the greatest boiling point).



2

1

3