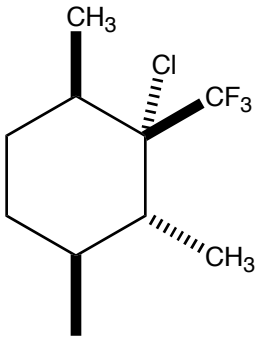
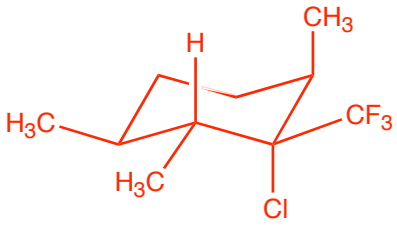
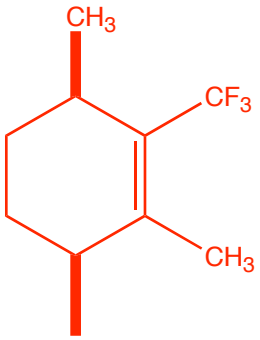
1a) 5pts. Draw an acurate 3D picture the following cyclohexane its lowest energy conformer.

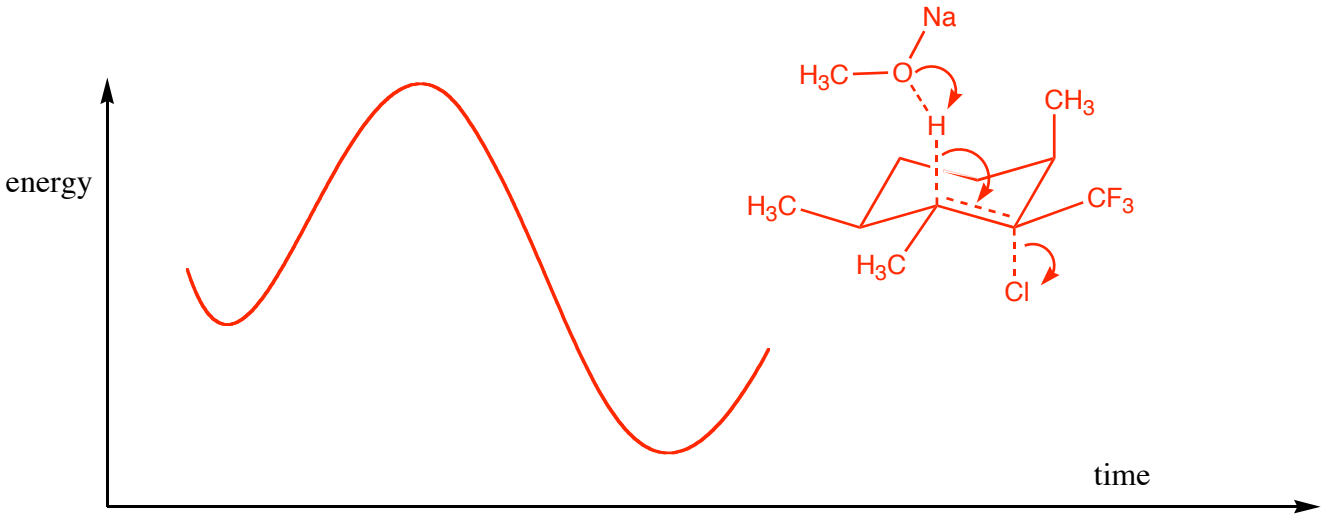




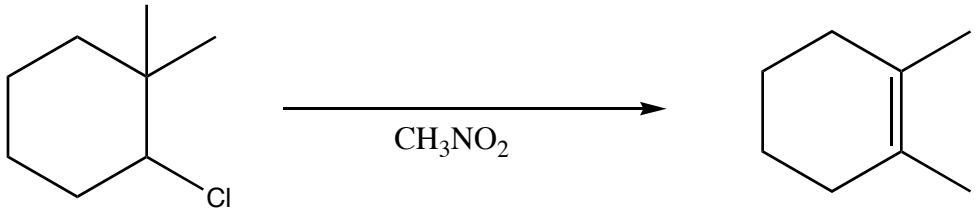
1b) 10pts. If **NaOMe were added to the structure above,** what would be the only product



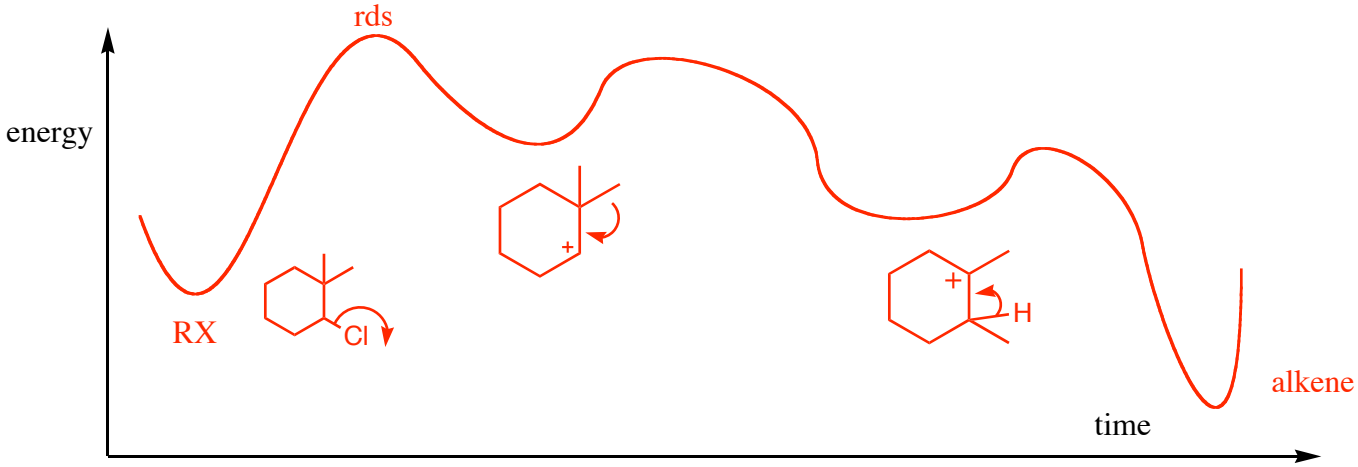
1c) 20pts. Draw the energy diagram for this process on the graph below, show the 3D structure of any new important intermediate(s) or transition state(s). Use curly arrows to show the flow of electrons.



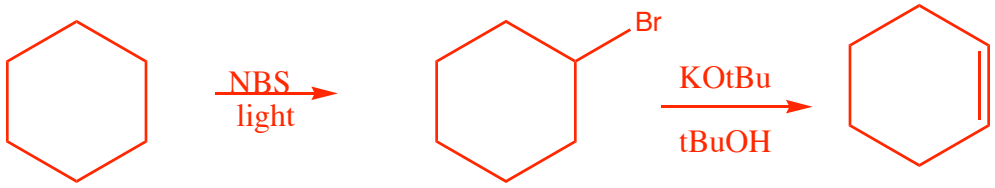
The following reactions was observed



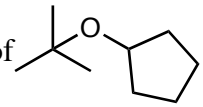
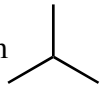
2a) 25pts. Draw the energy diagram for this multi-step process on the graph below, show the structure of any new important intermediate(s) or transition state(s). It would be useful to write the mechanism first and then use curly arrows to show the flow of electrons. Think about the relative energy levels of the interemediates and then draw the energy diagram. Lable the rate determining step.

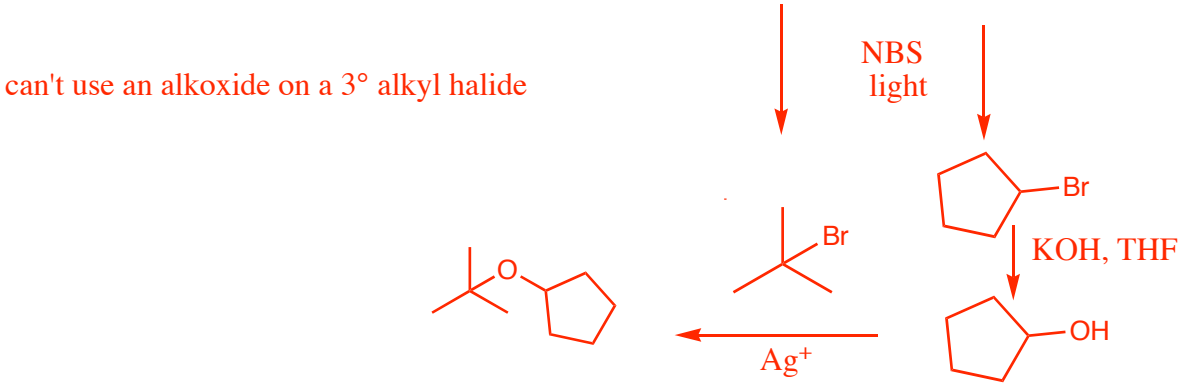


3a) 10pts. propose a synthesis of cyclohexene starting from cyclohexane



bulky base, in protic solvent, heat good

3b) 10pts. Propose a synthesis of  starting from  and 



4) 30pts. Fill in the boxes with the most appropriate reagents, product or starting material