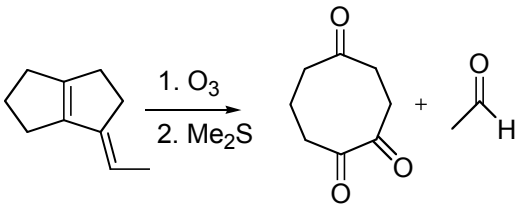
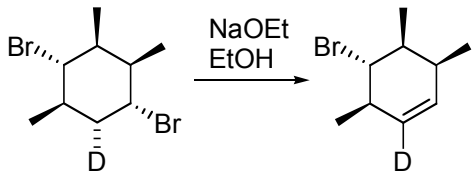
Chem. 30A- Week 10

Final prep:

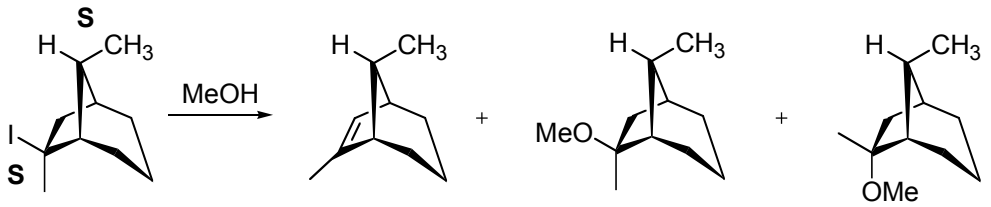
1.



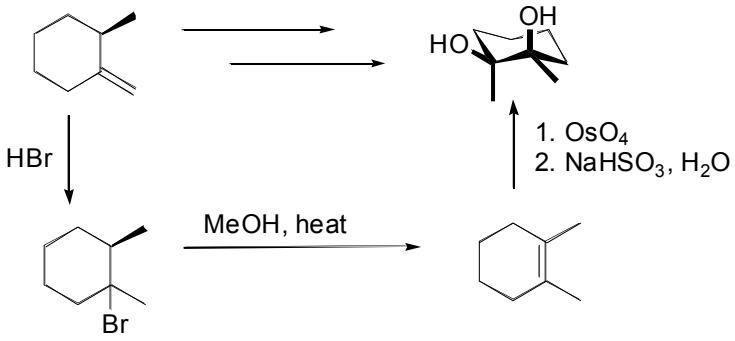
1b.



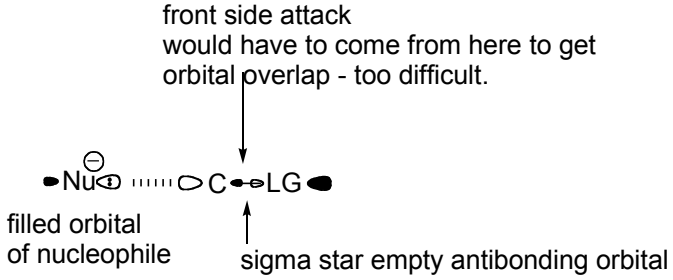
2.



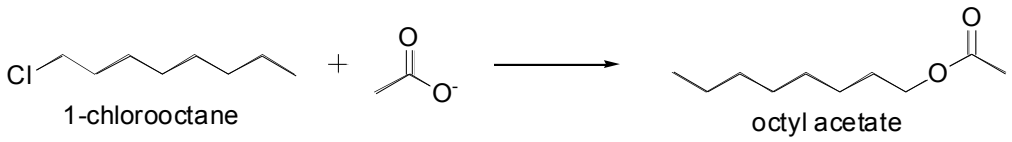
3.



4. Draw the orbital diagram that explains why backside attack is favored for SN2 reactions.



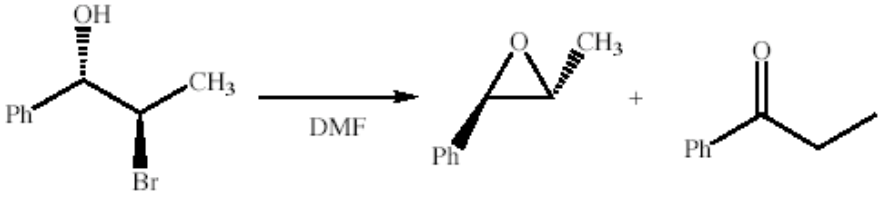
5. Account for the fact that the rate of reaction of 1-chlorooctane with acetate ion to give octyl acetate is greatly accelerated by the presence of a small quantity of iodide ion.

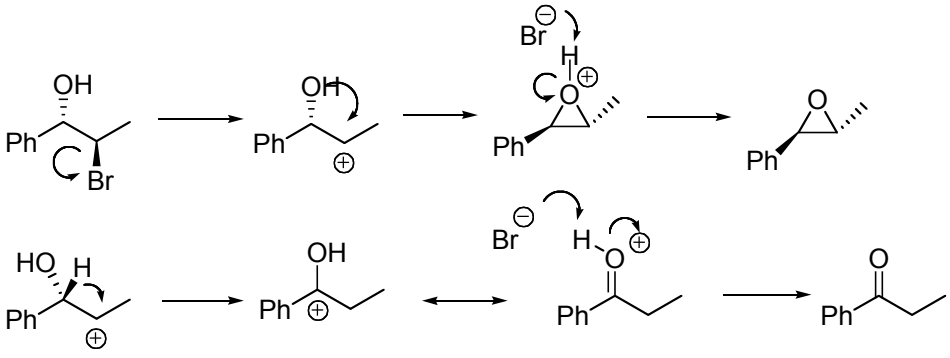


Cl^- is a relatively poor leaving group, and acetate is a poor nucleophile. Substitution reaction would proceed at a very slow rate. I^- is very good as both. 1-chlorooctane reacts with iodide to form 1-iodooctane, which is then more reactive toward substitution by acetate. Reaction with acetate creates the desired product and regenerates the iodine, so the cycle continues.

6.

Write an S_N1 mechanism that accounts for the reactions products shown.





7. Compound X is optically inactive and has the formula $C_{16}H_{16}Br_2$. On treatment with strong base, X gives hydrocarbon Y, $C_{16}H_{14}$. Compound Y absorbs two equivalents of hydrogen when reduced over a Pd catalyst and reacts with ozone to give two fragments. One fragment, Z, is an aldehyde with formula C_7H_6O. The other fragment is glyoxal, CHOCHO. Formulate the reactions involved, and suggest structures for X, Y, and Z. What is the stereochemistry of X?