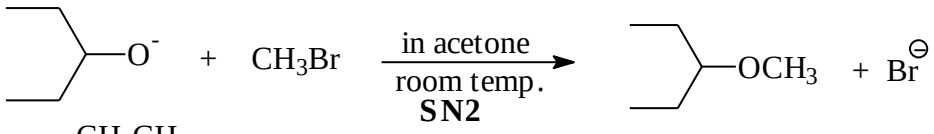
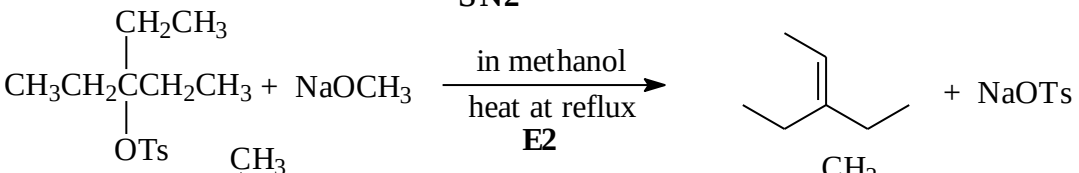
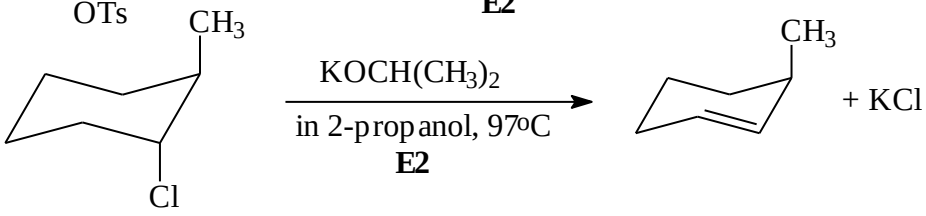
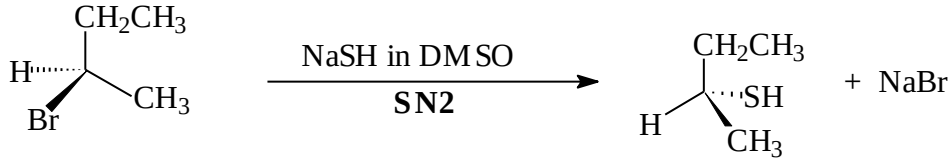
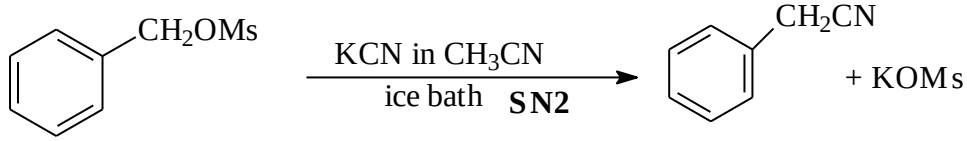
1.(24) The following reactions either proceed through an E2 or an S_N2 mechanism. Give the major product of the following bimolecular reactions.

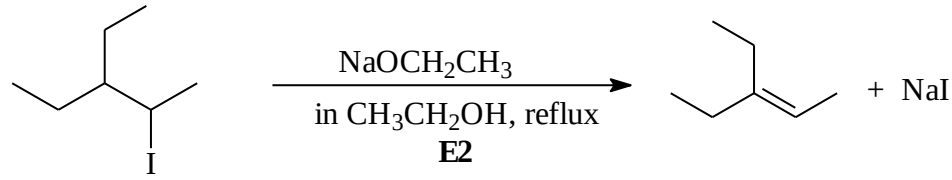
a) 

b) 

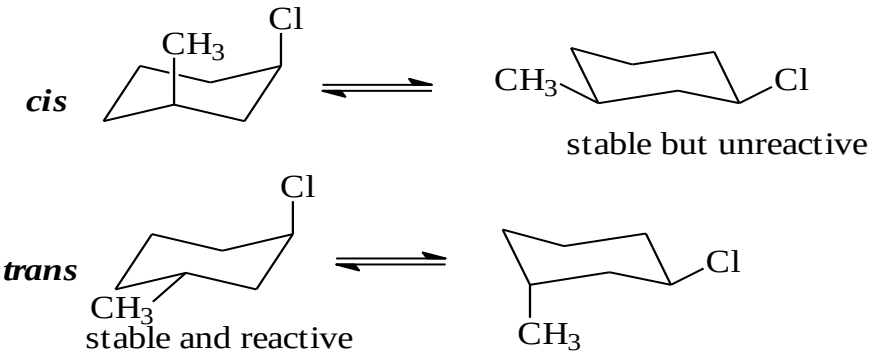
c) 

d) 

e) 

f) 

2.(12) The compound **cis 1-chloro-3-methylcyclohexane** undergoes an E2 reaction about 1/1000 as fast as the corresponding trans isomer. *Both isomers give the same two products*. Using *well-drawn* conformations (hint) of the two compounds, explain the difference in reaction rate and draw the 2 products.



The reactive conformation is when the leaving group is **axial**. For *cis*, this is an extremely unstable conformation whereas for *trans*, it is the preferred conforma Hence, the *cis* isomer will be very slow to undergo an E2 reaction.