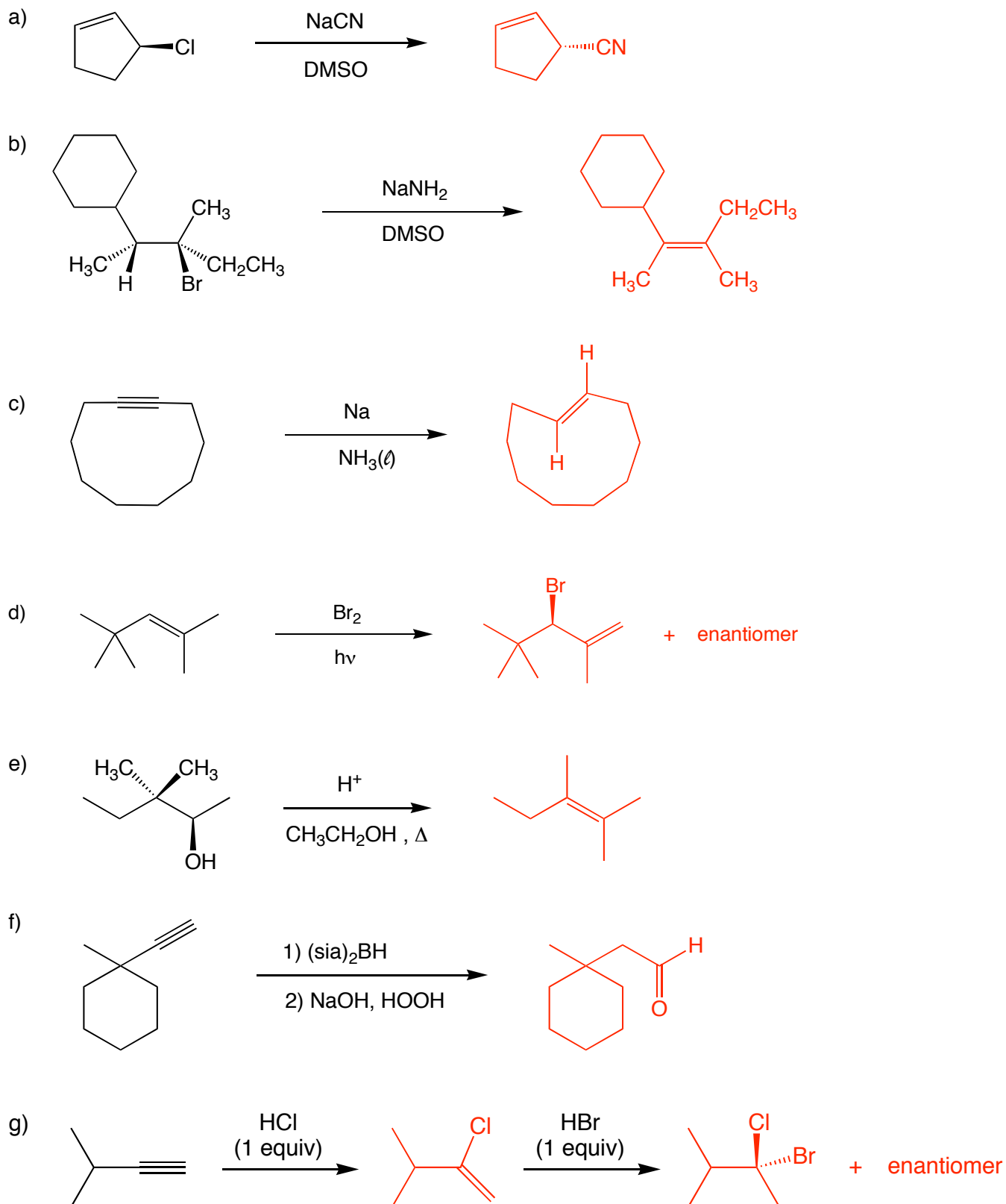
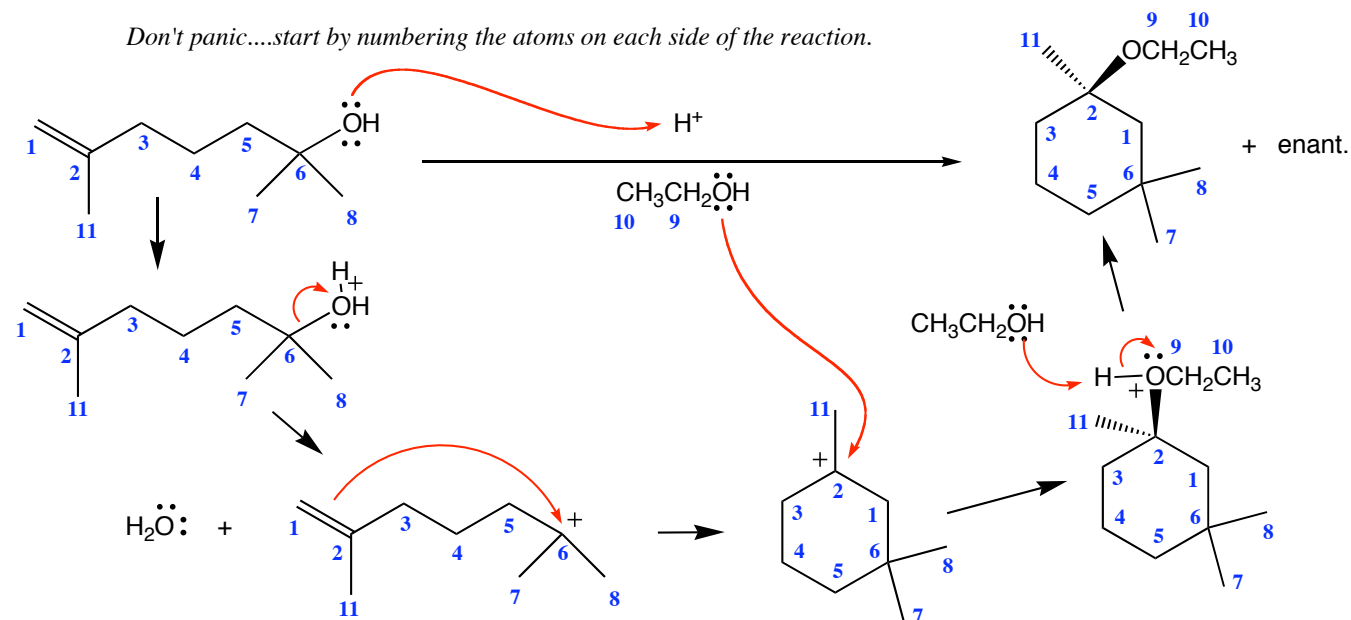


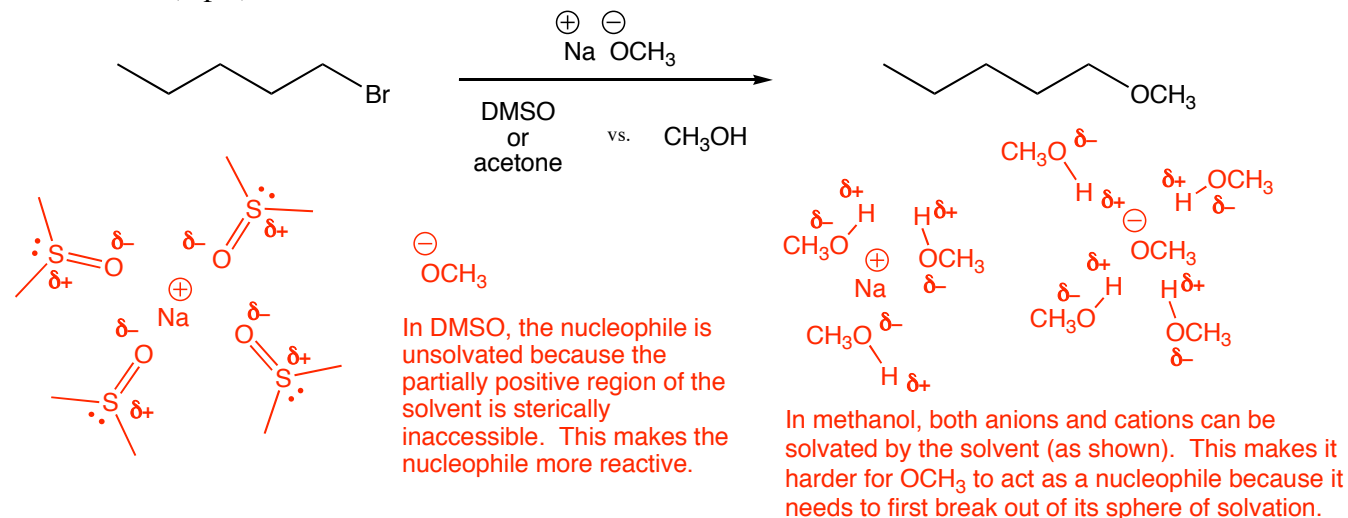
1) Predict the *major* organic product of each of the following reactions. If more than one product are equally favored, draw each product. (35 pts)



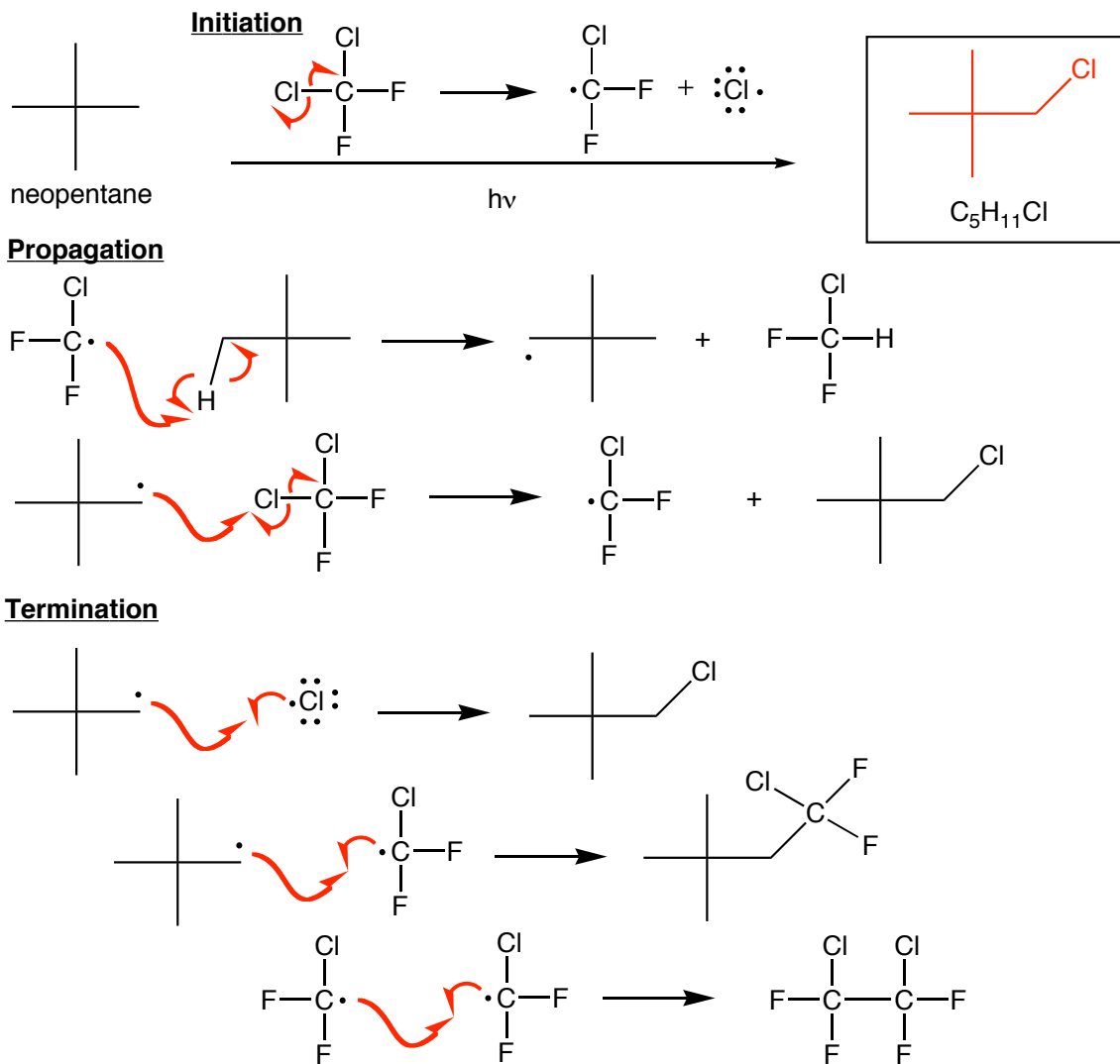
- 2) Provide a mechanism for the following transformation. For full credit, you need to show all intermediates, formal charges, & electron pairs in your mechanism. (12 pts)



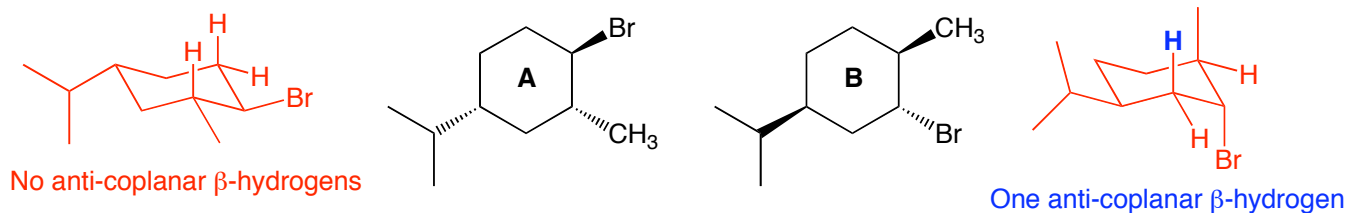
- 3) Explain, using pictures and words, why the reaction shown is faster in DMSO or acetone than it is in ethanol. (9 pts)



- 4) Researchers have found that chlorofluorocarbons, chemicals that damage the ozone layer, can halogenate organic molecules when exposed to certain wavelengths of light. Provide a mechanism and predict the product for such a reaction using neopentane as the substrate. For full credit, *label the init., propag., and termin. steps* (provide at least 3 different termination steps). (12 pts)

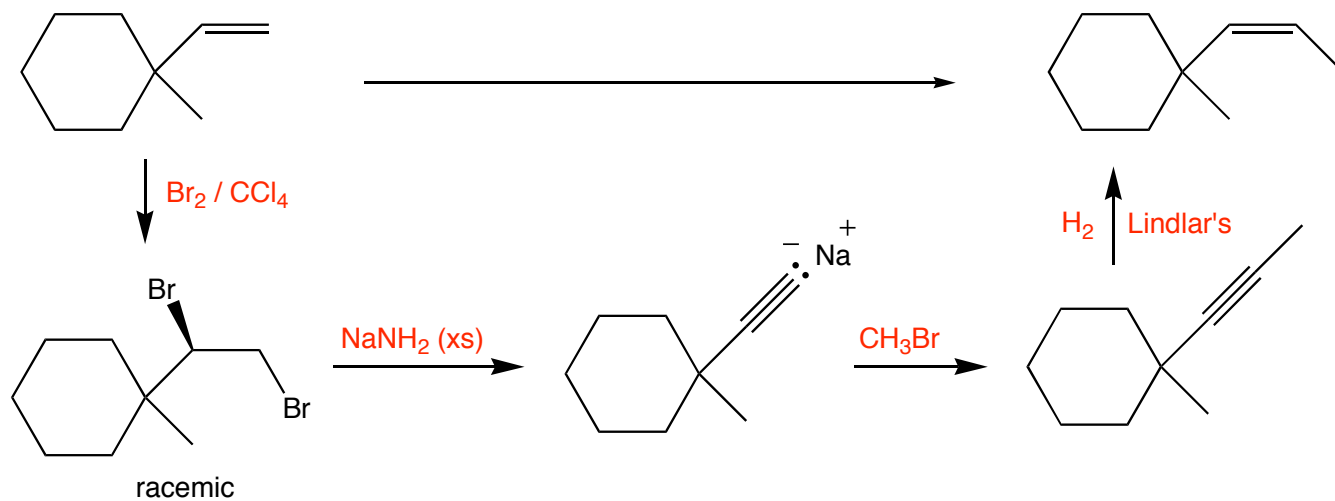


- 5) Which compound will undergo a faster E2 reaction with  $NaNH_2$  in DMSO? In order to receive full credit, you must use words *and* illustrations to explain your choice. (8 points)



When shown in their most stable conformations, only **B** has a beta proton that is anti-coplanar to the leaving group. **A** would have to undergo a ring flip to the less stable conformer in order to have an anti-coplanar beta hydrogen. Since it is energetically unfavorable to place the isopropyl group axial, the ring flip will be slow, making the elimination slow as well.

6) Propose a synthesis (sequence of reactions) that will accomplish each of the following transformations. Be sure to include the products of each step. (24 points)



Using these two starting materials...

