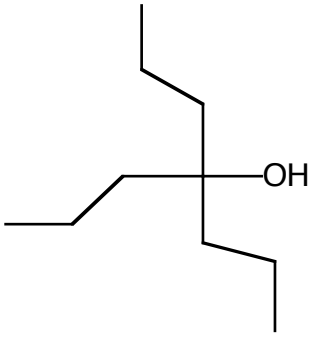
Hour Examination #2, Chemistry 302X - 2006

"Science is divided into Bowlahoola & Allamanda."
William Blake

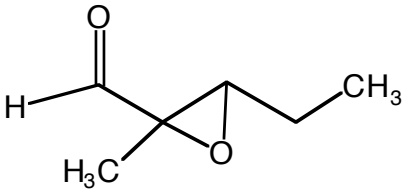
1 (21 points). Devise syntheses for the following molecules. You may start from alcohols containing no more than three carbons, trifluoroperacetic acid, formaldehyde, pyridine, and inorganic reagents of your choice. Need something else organic? Ask and we'll tell you if you can use it.



(a)

$(CH_3CH_2CH_2)_3CH$

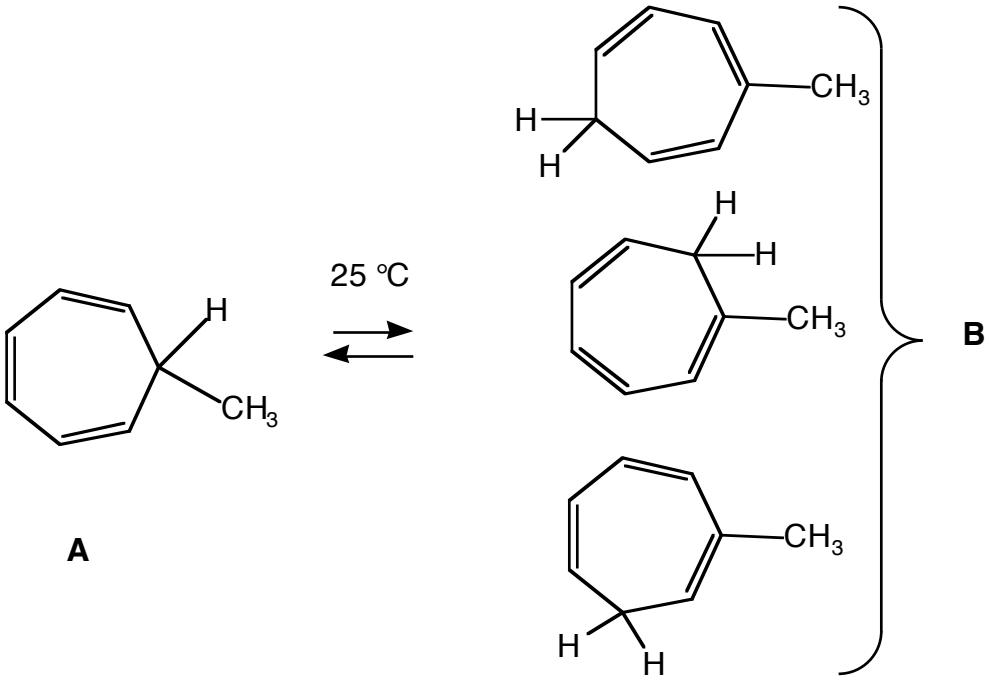
(b)



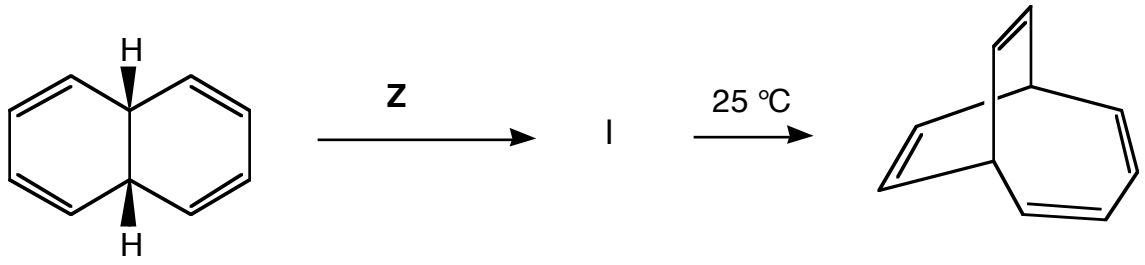
(you may ignore stereochemistry)

(c)

2. (a, 12 points)) 7-substituted 1,3,5-cycloheptatrienes (**A**) are notoriously hard to isolate. At room temperature they equilibrate with a mixture of all other possible substituted cycloheptatrienes (**B**). Provide an arrow formalism mechanism for these changes:



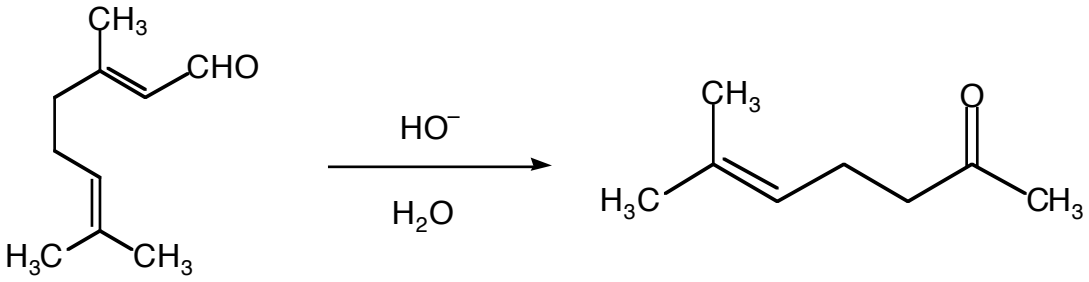
(b, 12 points) Give us a structure for I, identify **Z** (heat or light), and draw arrow formalisms for the formation of I and its conversion into **A**.



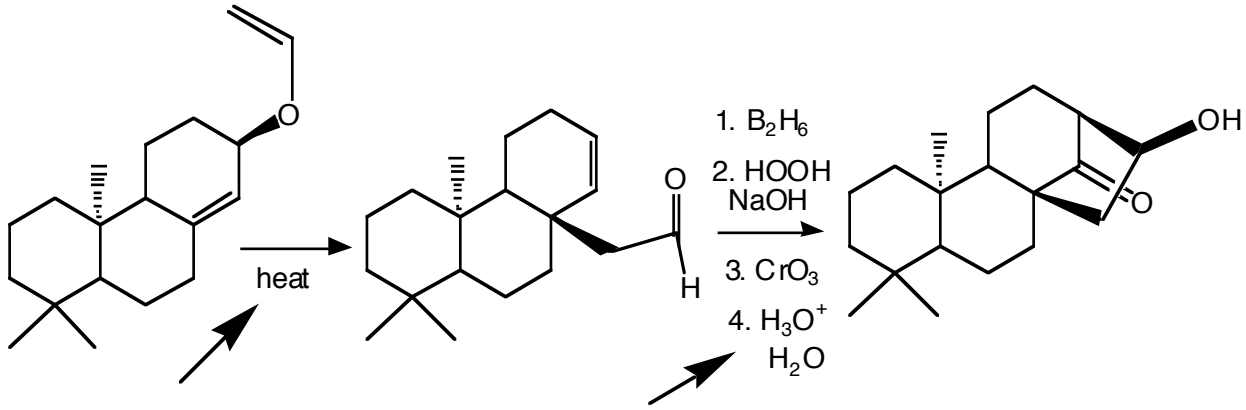
Z = heat or light

A

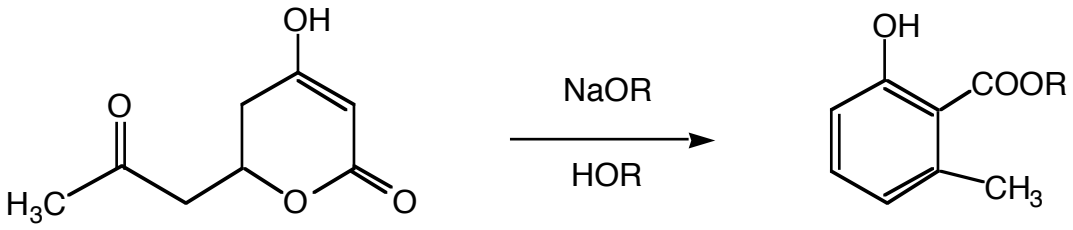
3 (18 points). Write a mechanism for the following change in which a couple of carbons are lost. What is the fate of those two lost carbons? Do they just evaporate into the aether?



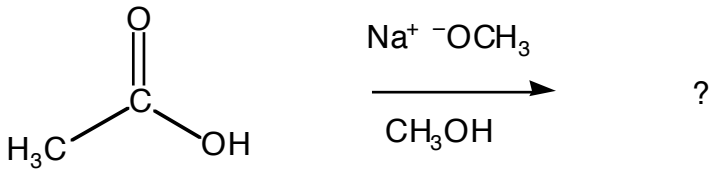
4 (15 points). There are some nice reactions in the synthesis of kaurene. Here are two. Please write good arrow formalism mechanisms for the heat reaction and reaction 4 (arrows in the figure). In reactions 1, 2, and 3 just show us the products - you do not have to write detailed mechanisms. Once again, you need only draw out the important parts of the molecules. In reaction 4 why is the OH not eliminated?



5 (20 points). Write an arrow formalism for the following chenge. Be careful about detail, please.



6 (2 points) What are the products of the following reaction?



"I pledge that I have not violated the Honour Code on this examination."