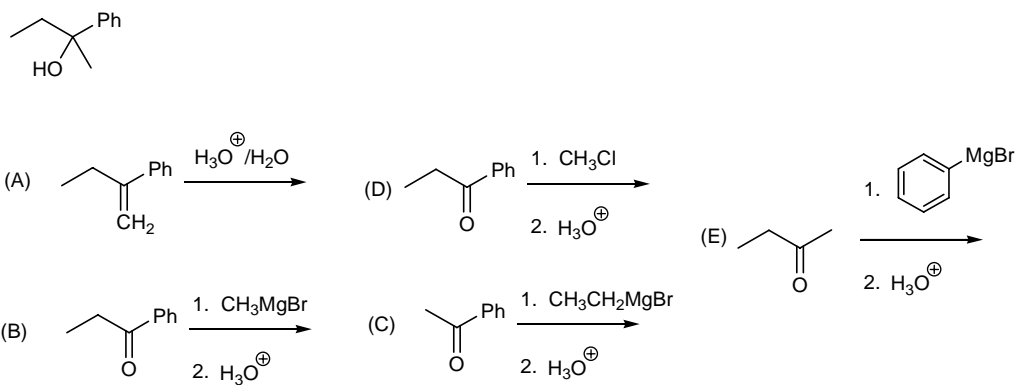


Multiple Choice Questions. 60 points

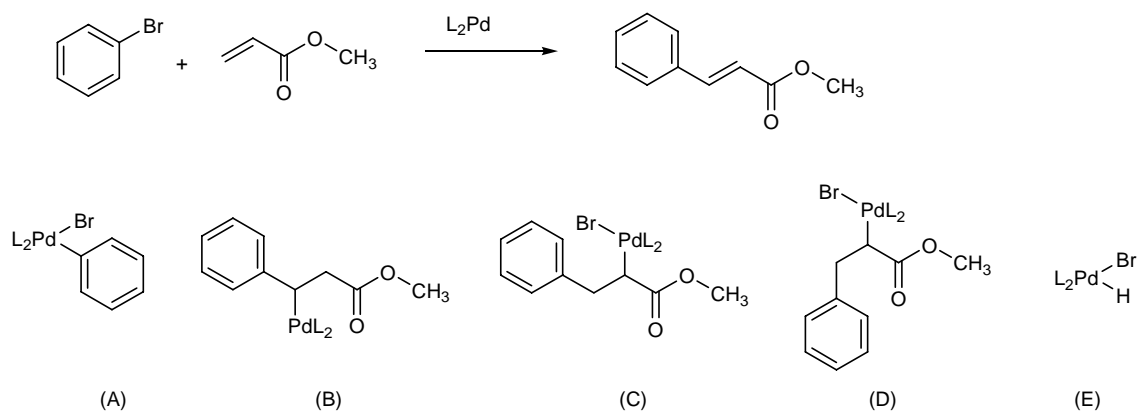
1. Choose the reaction scheme that could **not** be used to prepare the following alcohol.

D



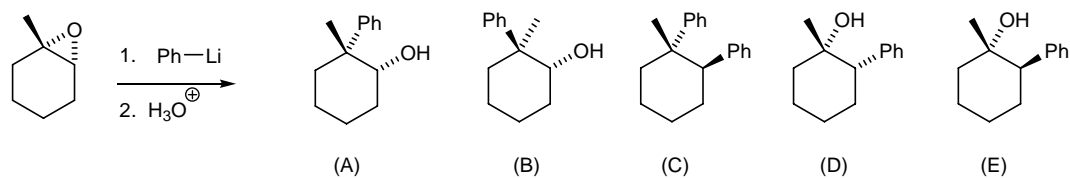
2. Choose the species that is **not** an intermediate in the palladium catalyzed Heck reaction.

B



3. Choose the major product of the following reaction.

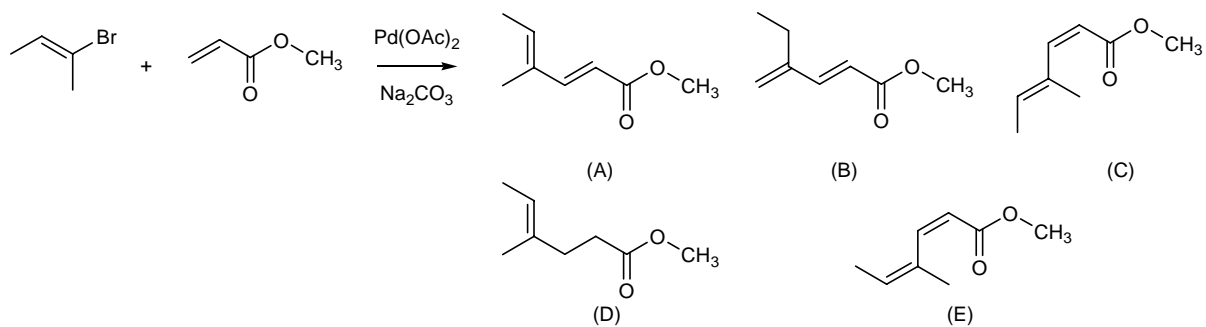
E



## Source

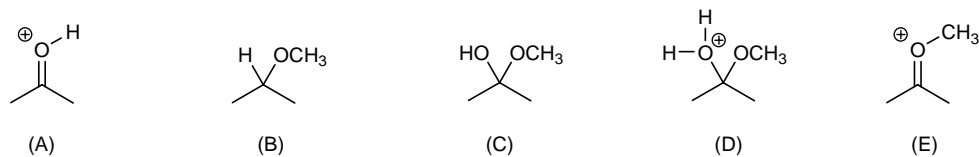
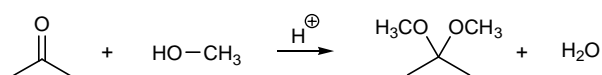
4. Chose the major product of the following reaction.

A



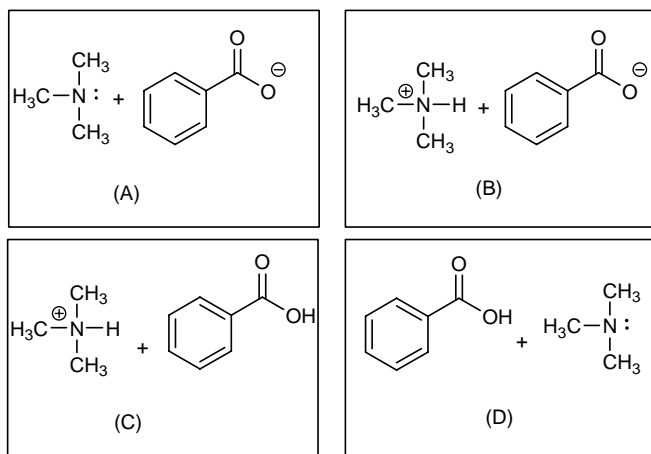
5. Choose the species that is not an intermediate in the following acid catalyzed reaction.

B

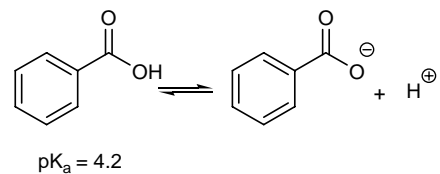
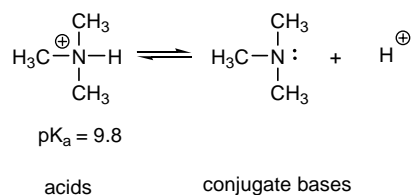


6. Choose the answer that has correctly selected the major species of the following two acids to be present in blood naturally buffered at pH = 7.2.

B



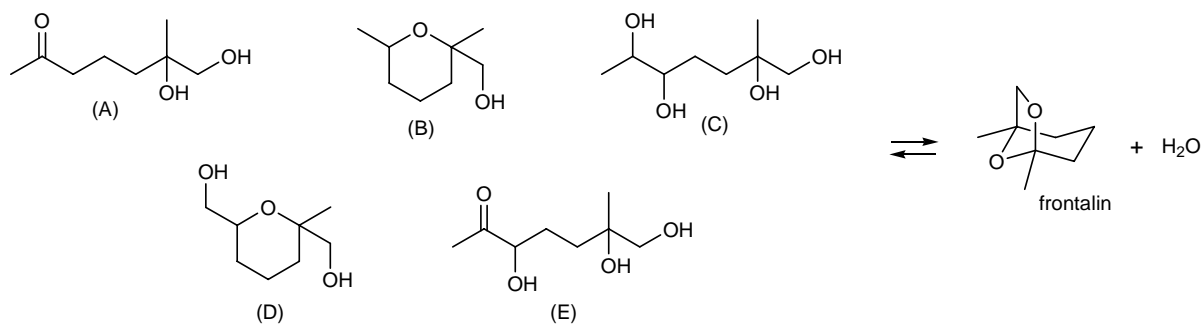
possible species in blood buffered at pH = 7.2



## Source

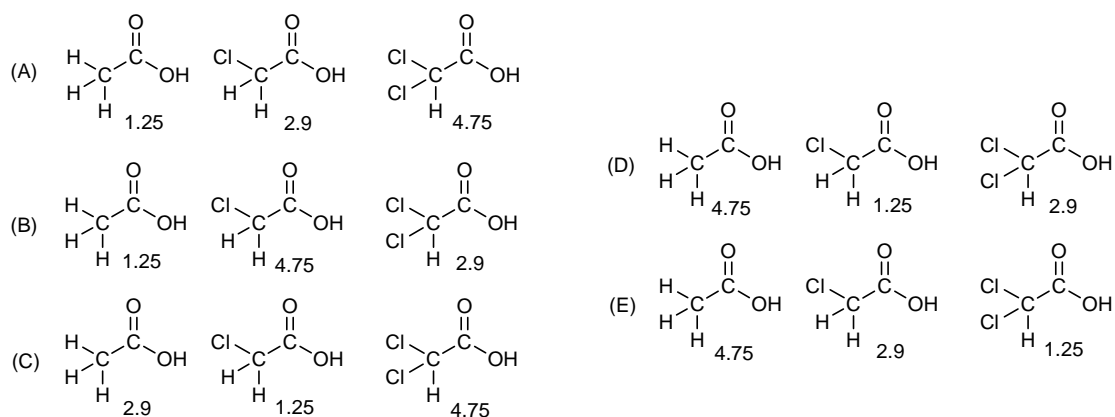
7. Choose the following compound that will cyclize to give the pheromone frontalin.

A



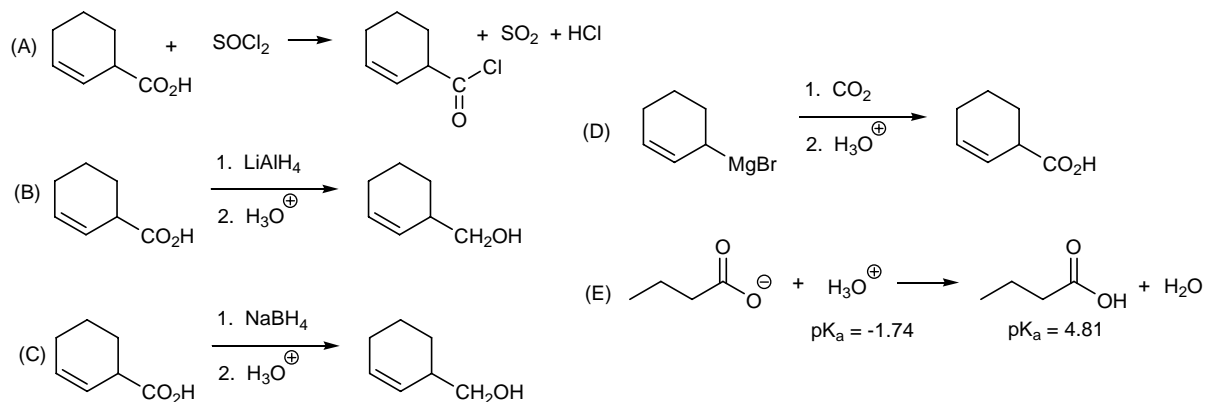
8. The following acids have pK<sub>a</sub> values of 1.25, 2.9 and 4.75. Choose the answer that has these correctly assigned.

E



9. Choose the reaction that is **not** correctly shown.

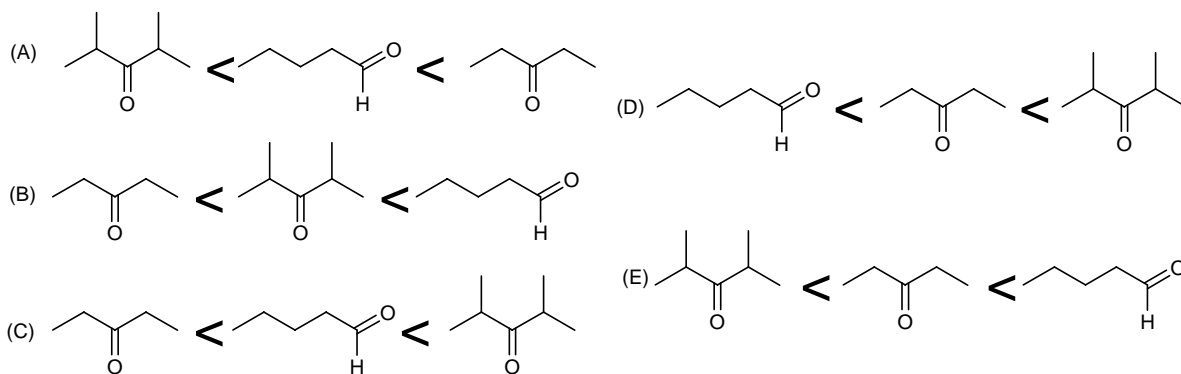
C



## Source

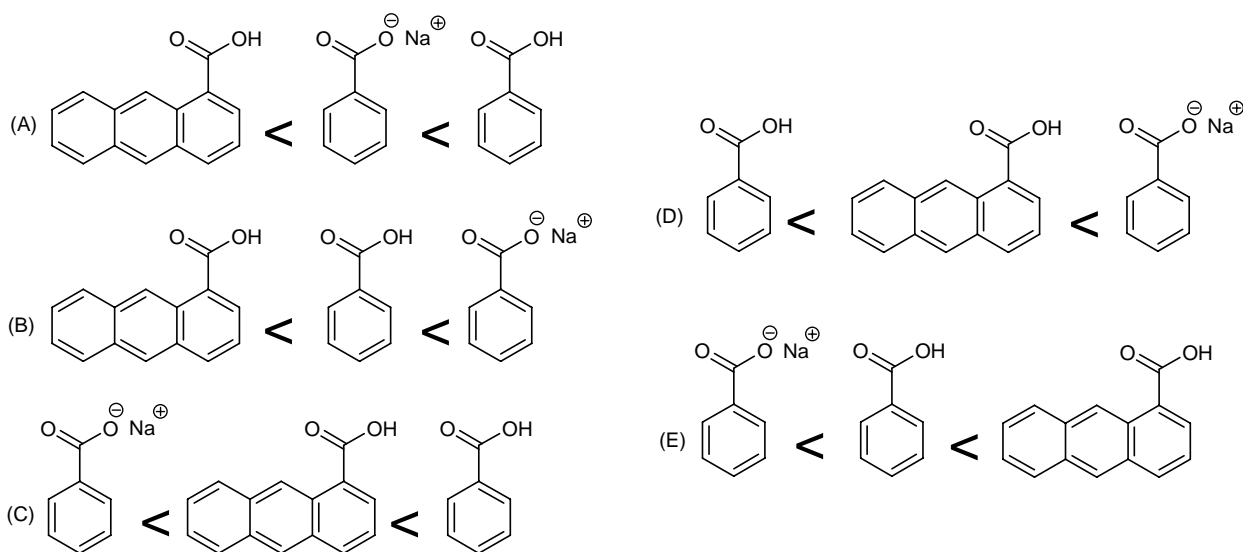
10. Choose order that has the following compounds correctly arranged with respect to increasing rate of reaction with  $\text{LiAlH}_4$ . (most reactive compound on the right)

E



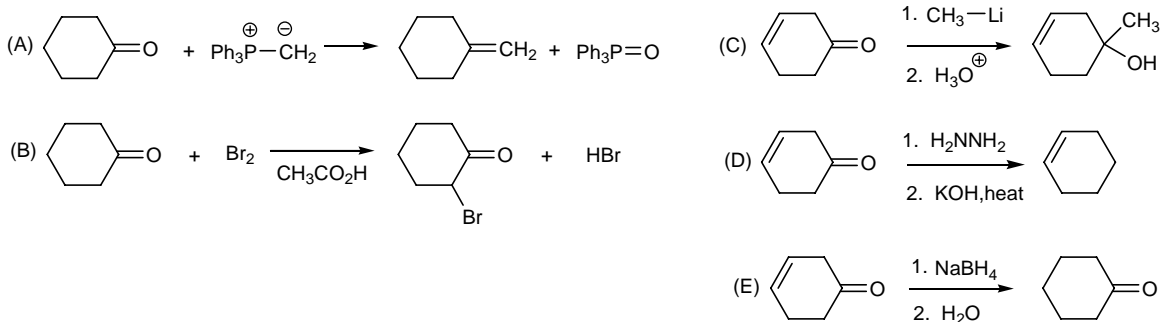
11. Choose order that has the following compounds correctly arranged with respect to increasing solubility in water. (most soluble compound on the right)

B



12. Choose the reaction that is **not** correctly shown.

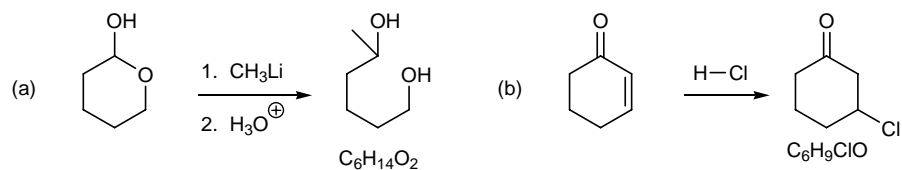
E



## Source

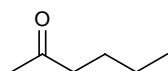
### Short Answer Questions. 40 points.

13. Predict the products of the following reactions.

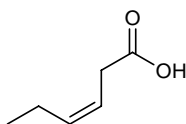


14a. Give an acceptable name for the following structure.

14b. Give the correct structure for the following name.

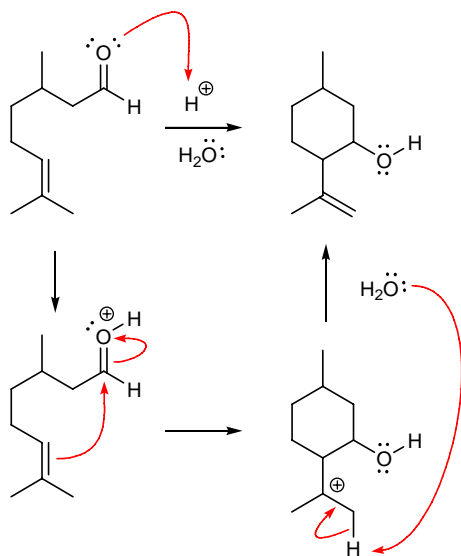


2-hexanone  
14a



14b (Z)-3-hexenoic acid

15. Using the curved arrow formalism, show the bond making and bond breaking that occurs in the following transformation.



## Source

16. Propose a synthesis of the following compound from bromobenzene, compounds containing 4 carbon atoms or less, and any other necessary reagents.

