CHEMISTRY 66H
Exam 2
M.T. Crimmins
April 2, 2002

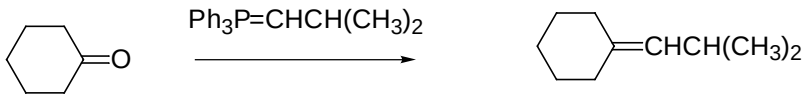
Name_____

Pledge: I have neither given nor received aid on this exam.

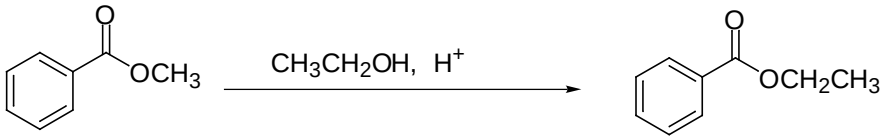
Signature_____

I. Predict the major organic product of the following reactions. Be sure to indicate stereochemistry where appropriate. 5 points each

1.



2.



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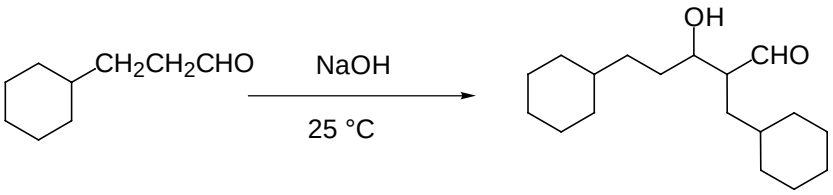

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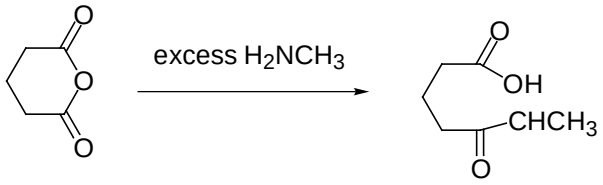

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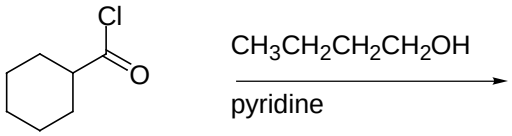

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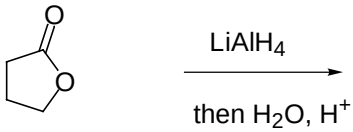

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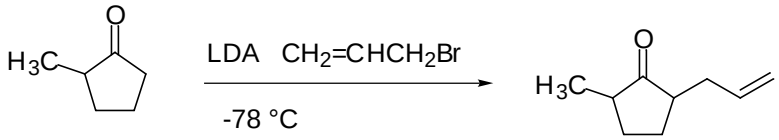

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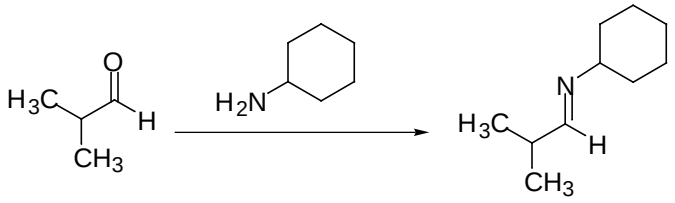

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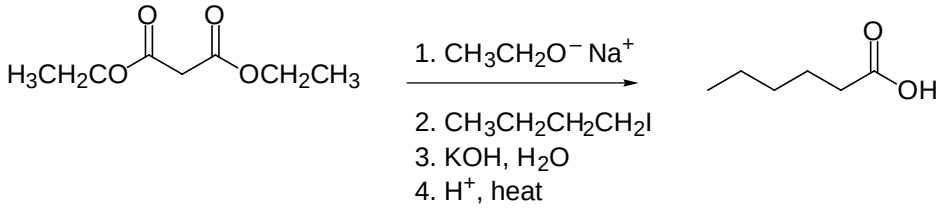
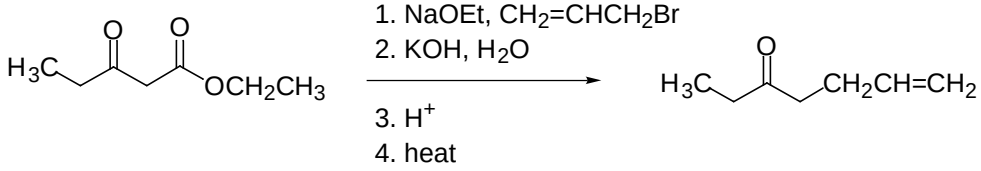


Give reagents to carry out the following transformations. Some may require more than one step. 5 points each

10.



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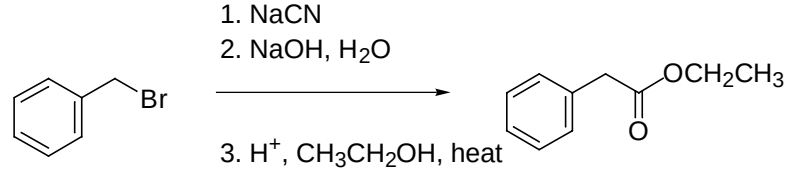
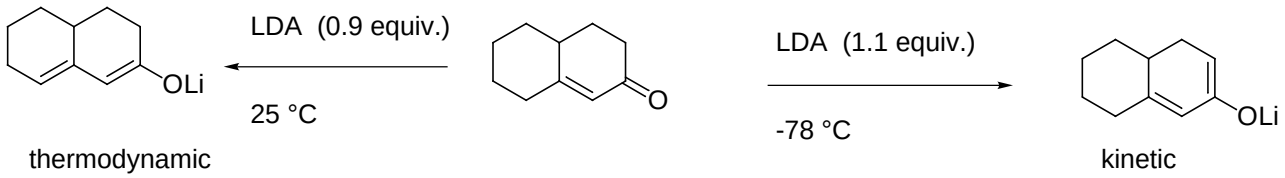


12. Show the kinetic and thermodynamic enolates of the ketone below. Explain briefly. 6 points

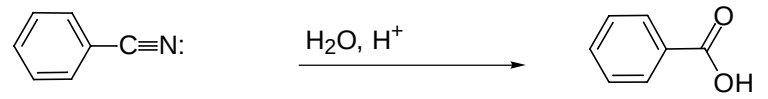


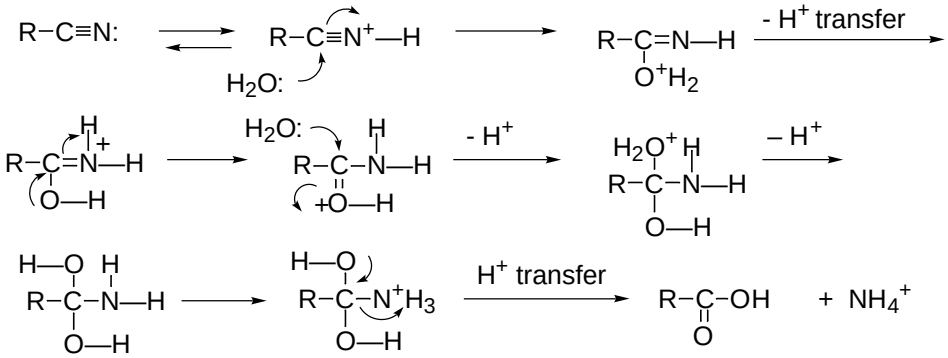
thermodynamic kinetic

kinetic enolate forms fastest and forms by removal of the least hindered proton or in this case, the proton which can be abstracted when the LDA coordinates to the ketone.

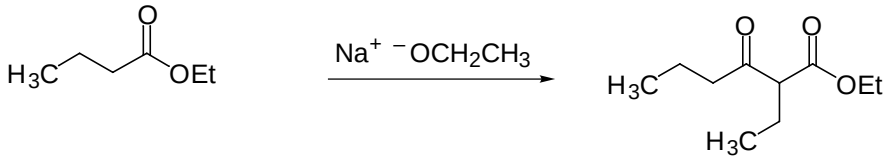
thermodyanmic enolate is the most stable which forms in the presence of a proton source at higher temperature. The enolate on the left is more stable because it has three differnet contributing resonance structures to delocalize the negative charge.

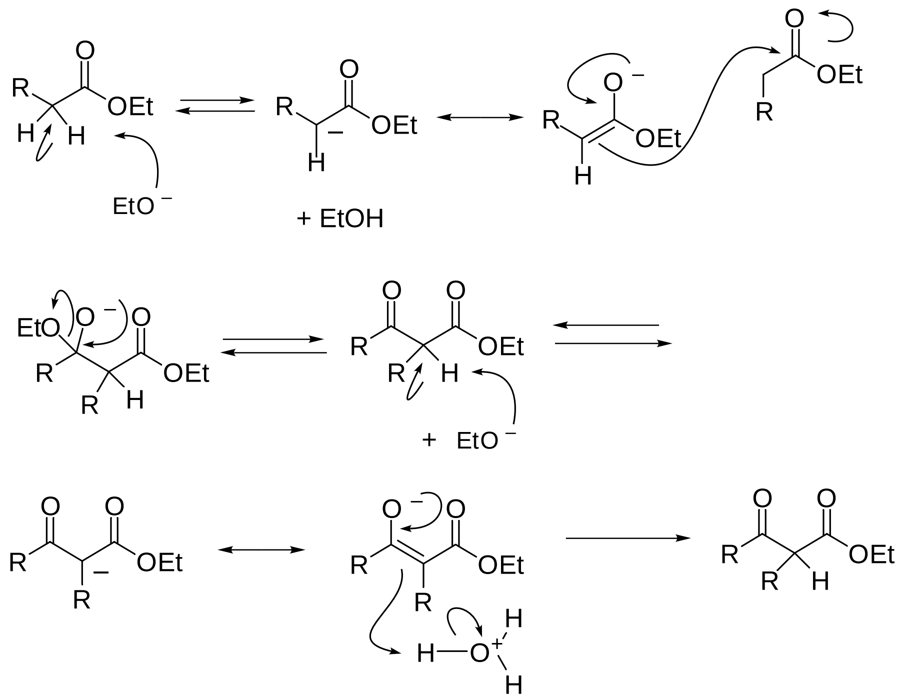
13. Give a stepwise, detailed mechanism with arrows and intermediates for each of the following reactions. 6 points each.



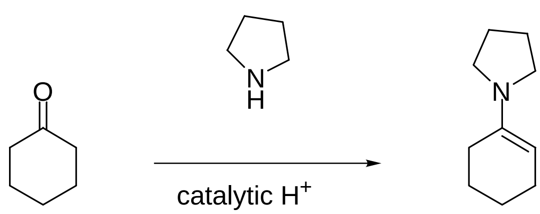


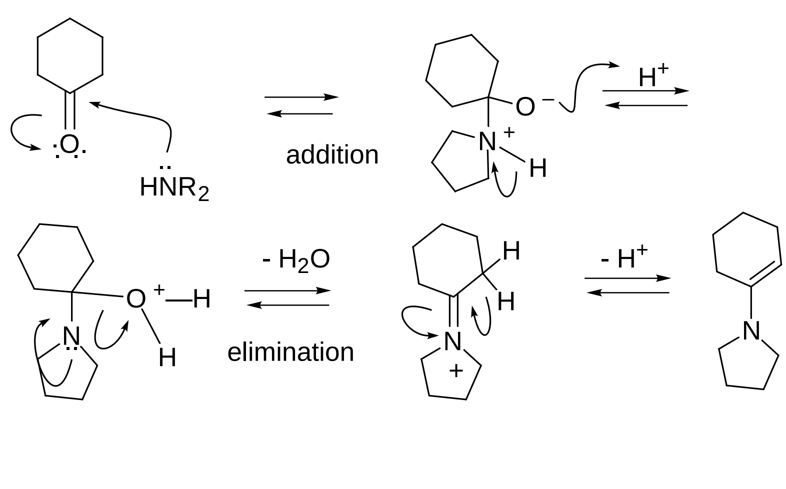
14.



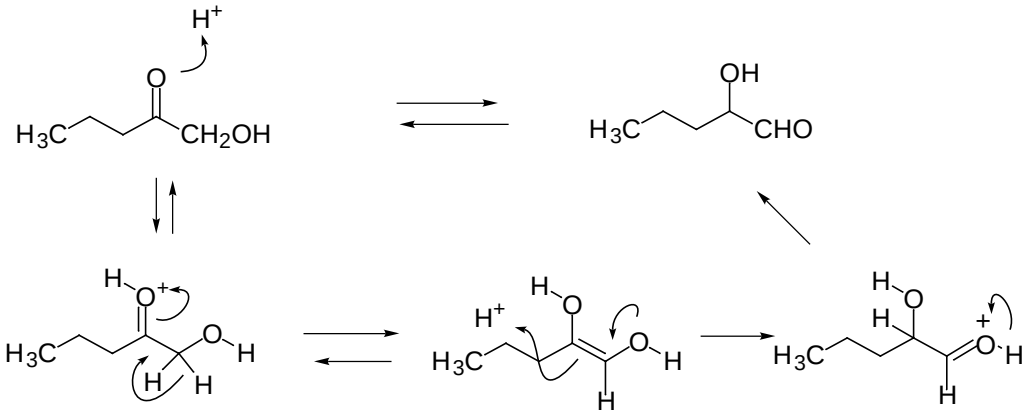


15.

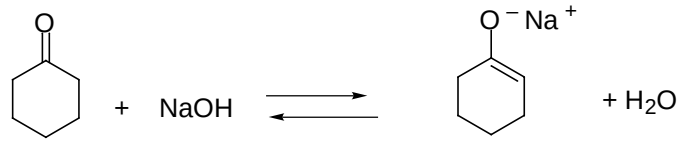




16. Provide a detailed mechanism for the following interconversion. (6 points)

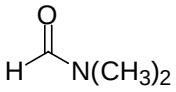


17. Indicate which side of the equilibrium will be favored and briefly explain. (5 points).



right side is favored becuase pKa of water is lower than pKa of cyclohexanone

19. Explain why N, N-dimethylformamide has two singlets for the methyl groups. (5 points).



N,N-dimethylformamide

because of the donation of the nitrogen lone pair into the amide carbonyl, there is significant double bond character to the amide C–N bond causing the barrier to rotation about the C–N bond to be high thus making the two methyl groups differnet in the NMR