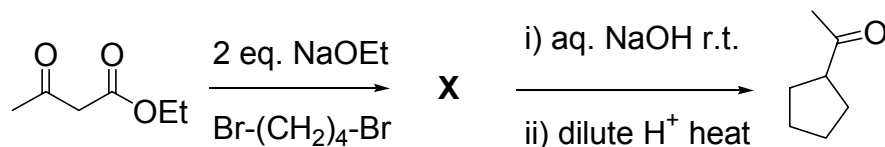


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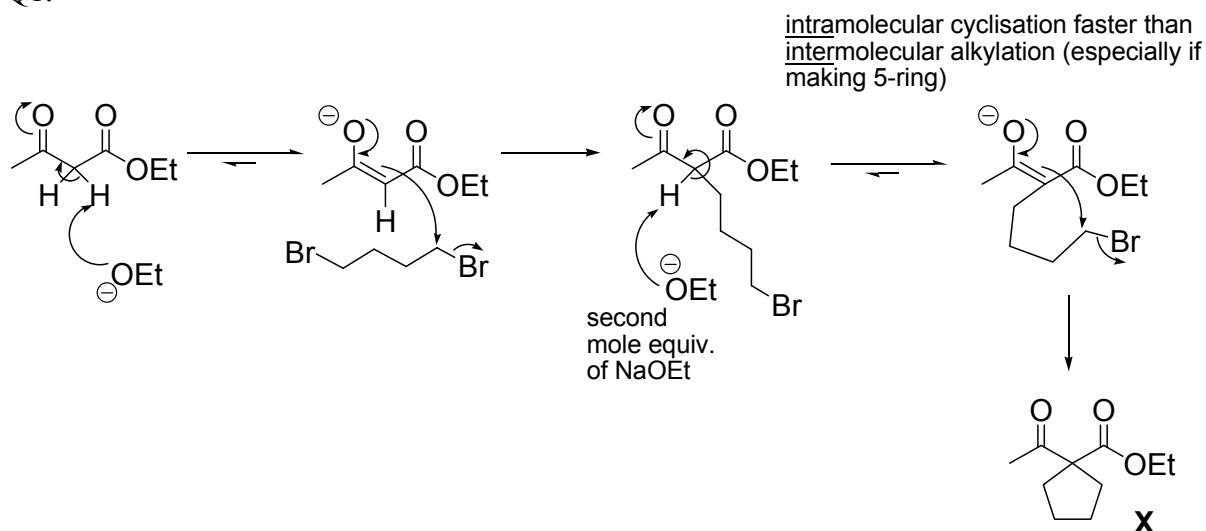
Year 2 Seminars, 06524, Semester 2, 2006
Bifunctional Chemistry Test

Consider the scheme below then answer the questions:

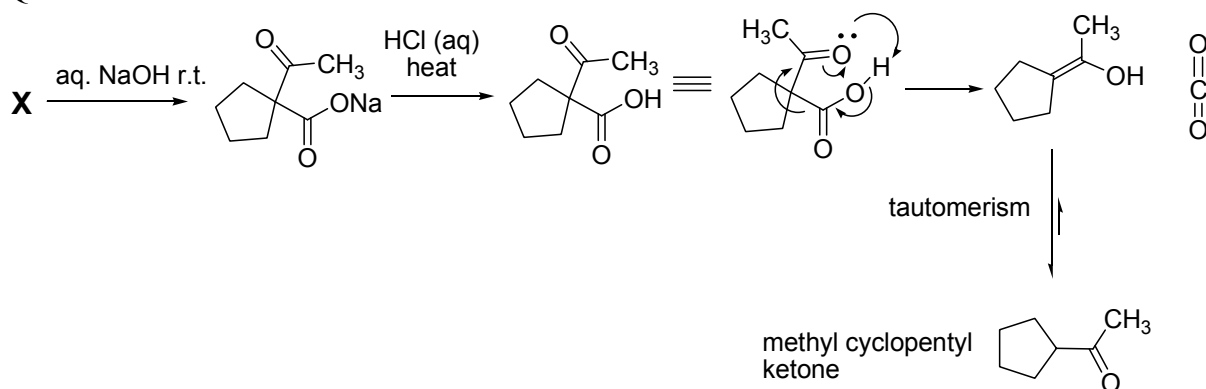


- (Q1) Identify **X** and give a mechanism for its preparation.
(Q2) Give a mechanism for conversion of **X** into acetylcyclopentane (methyl cyclopentyl ketone).
(Q3) Explain briefly what would happen if acetone was allowed to react with 2 eq. NaOEt and 2 eq. Br(CH₂)₄Br?

Q1.



Q2.

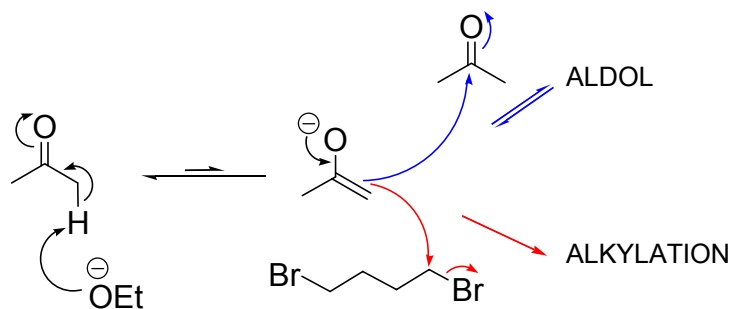


Q3.

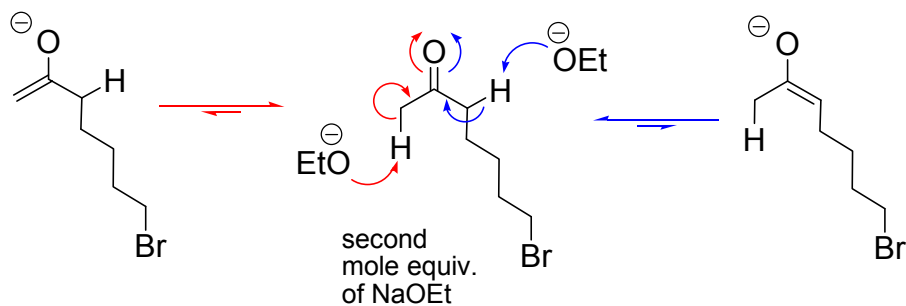
Acetone (propanone) has hydrogen atoms considerably less acidic than ethyl acetoacetate. Therefore, in reaction with NaOEt (weak base) there is always ketone present in the

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equilibrium mixture as well as enolate. An aldol reaction is therefore one possible reaction as well as alkylation.



Also the second deprotonation of the alkylated product could take place at the same carbon as the first, or on the other side of the C=O as the acidity difference will not be too great. Two moles of dibromide also complicates matters and so dimers / polymers and dialkylated / and or cyclic products can form.



Overall, a right old mixture would be produced!