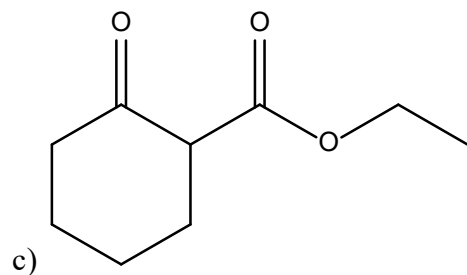
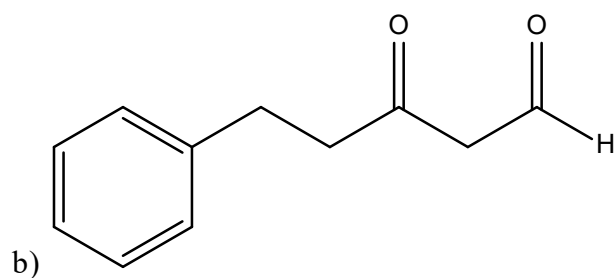


Organic II
Assignment # 10
Spring 2021

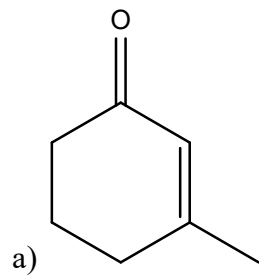
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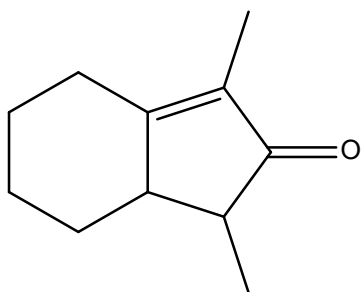
1) Write the structure of the most stable enolate derived from each of the following. Give the three major resonance contributors of each enolate.

a) 2-Methyl-1,3-cyclopentanedione

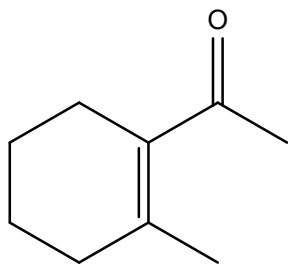


2) Each of the following products can be prepared by an intramolecular aldol condensation of a diketone. Give the structure of the diketone that would give the respective product.



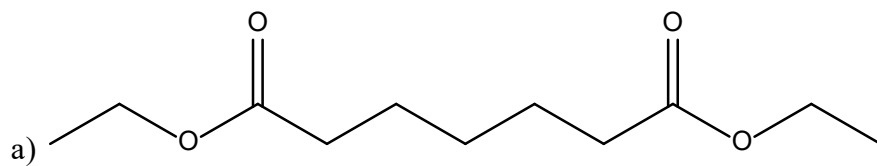


b)

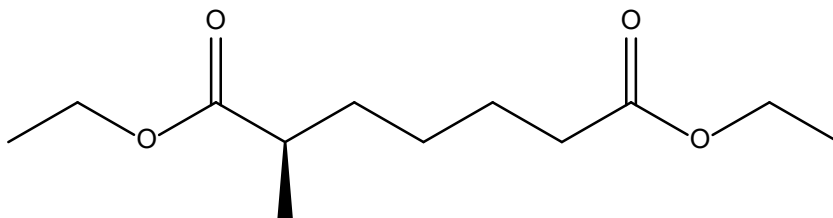


c)

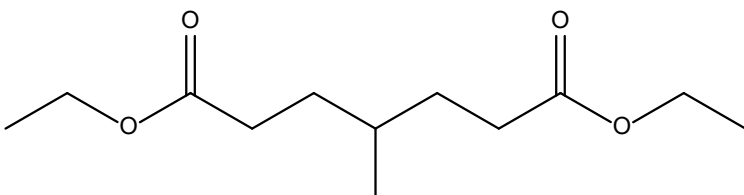
3) Write the structure of the Dieckmann cyclization product formed on treatment of each of the following diesters with sodium ethoxide, followed by acidification.



a)



b)



c)

4) Outline a synthesis of the following molecules from any β -dicarbonyl compound and alkyl halide.

a) 3-Methylpentanoic acid

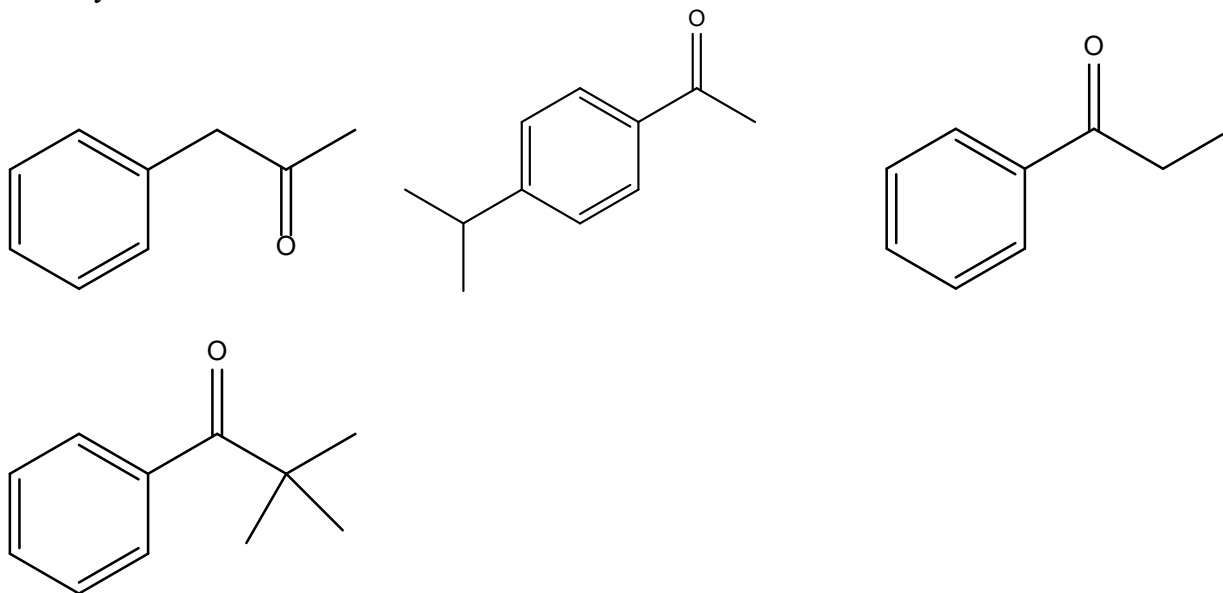
b) 1-Phenyl-1,4-pentanedione

c) 4-Methylhexanoic acid

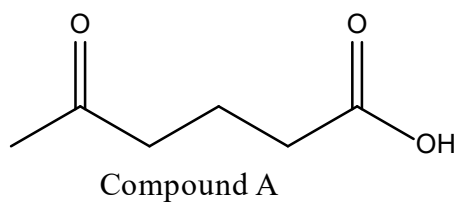
d) 5-Hexen-2-one

5) K for enolization of 2,4-cyclohexadienone is about 10^{13} . Explain why the enol is so much more stable than the keto isomer.

6) a) Which of the following is the most suitable for preparing a carboxylic acid by the haloform reaction? B) Explain why the other molecules are less suitable. C) Give the structure of the carboxylic acid.



7) Outline a synthesis of compound A from methyl vinyl ketone and diethyl malonate.



8) Give the structure of the expected organic product in the reaction of 3-phenylpropanal with each of the following.

a) Chlorine in acetic acid

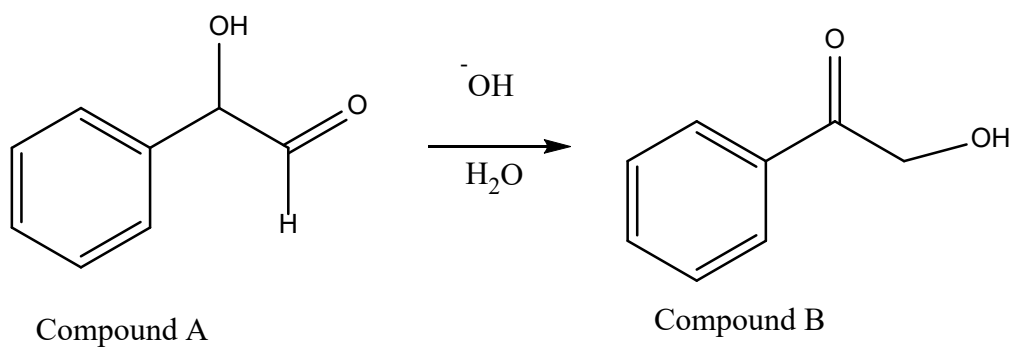
b) Sodium hydroxide in ethanol, 10 °C

c) Sodium hydroxide in ethanol, 70 °C

d) Product of part c with lithium aluminum hydride and then water

e) Product of part c with sodium cyanide in acidic ethanol

9) Compound A is difficult to prepare owing to its ready base-catalyzed isomerization to compound B. Write a reasonable mechanism for this isomerization.



10) The Knoevenagel reaction with malonic acid is often accompanied by decarboxylation. What is the likely product of the following reaction?

