Chem 332

Exam 2

April 7, 2006

Prof Fox

50 minutes

100 points

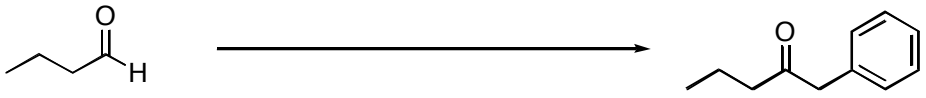
Show your work in detail

Write your name on every page

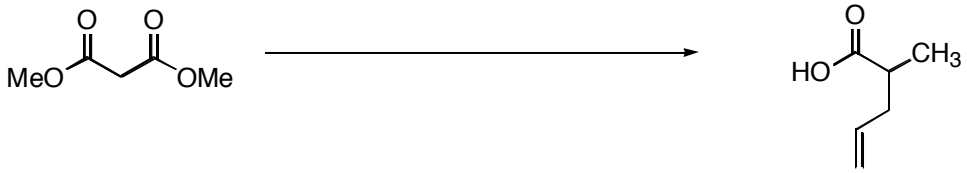
Name_____

1. Provide reagents. More than one step may be required Mechanisms are not needed. (5 points each)

a

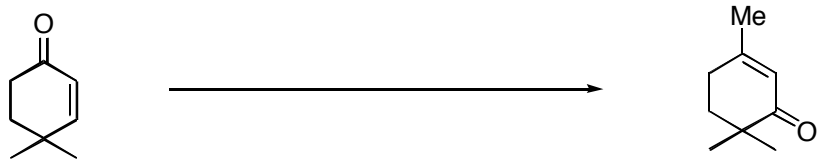


b

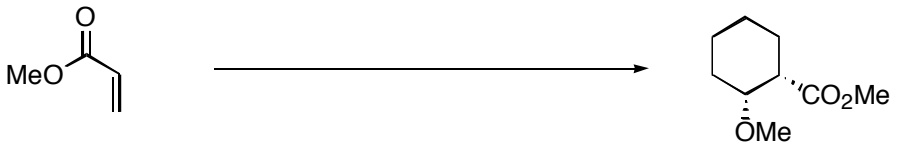


1. Provide reagents. More than one step may be required
Mechanisms are not needed. (5 points each)

c

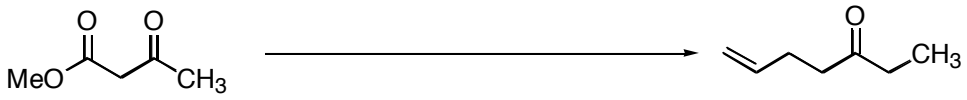


d

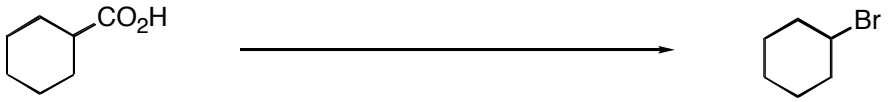


1. Provide reagents. More than one step may be required (5 points each)
Mechanisms are not needed. (5 points each)

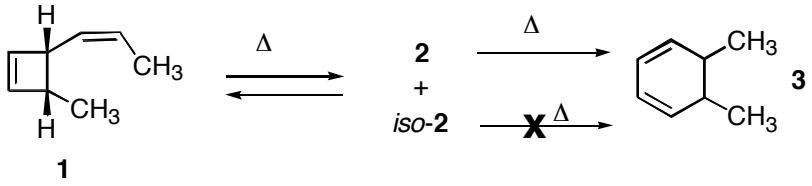
e



f



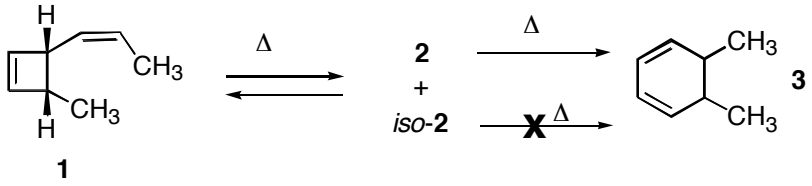
2. When compound **1** is heated, it forms an equilibrium mixture with product **2** and an isomeric product *(iso*-**2**). Product **2** further rearranges to a cyclohexadiene **3**. However, *iso*-**2** does not directly react to give **3**.



1

a. Provide structures for **2** and *iso*-**2.** Provide a detailed explanation for its formation (using a molecular orbital analysis). (10 points)

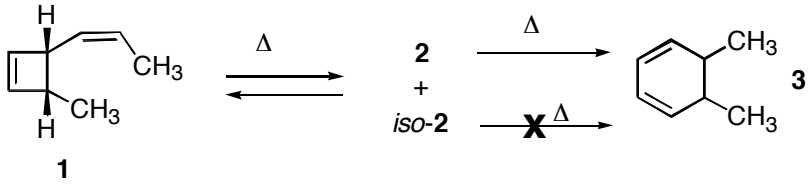
2. When compound **1** is heated, it forms an equilibrium mixture with product **2** and an isomeric product *(iso*-**2**). Product **2** further rearranges to a cyclohexadiene **3**. However, *iso*-**2** does not directly react to give **3**.



1

b. Provide an arrow pushing mechanism for the formation of **2** and **3**. (10 points)

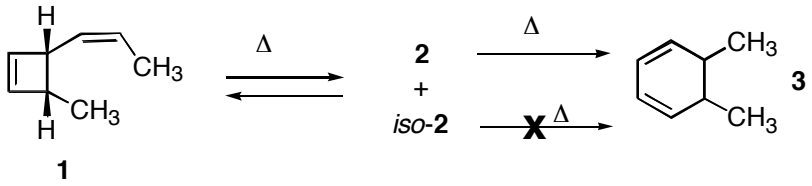
2. (cont)



1

c. Explain why *iso*-**2** does not rearrange to product **3** (10 points)

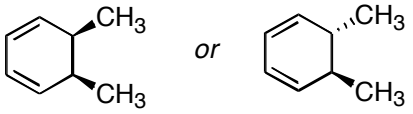
2. (cont)



1

d. Although two diastereomers with structure **3** are possible, only one is formed. Circle the correct diastereomer (cis or trans), and provide a detailed explanation for its formation (using a molecular orbital analysis). (10 points)

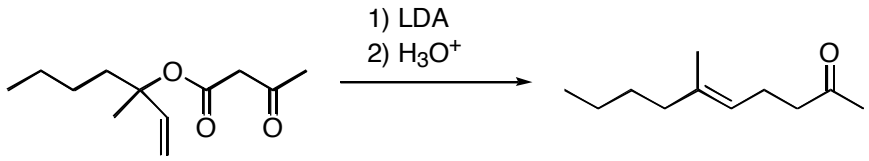
circle the diastereomer of **3** that is formed



cis **trans**

3. Provide a detailed arrow pushing mechanism (30 pts)

Molecular orbital analysis is NOT required



Scratch paper

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