



University of the Southern Caribbean

Maracas Royal Road, St. Joseph

Department of Chemical & Physical Sciences

CHEM242 – Organic Chemistry Lab II

Lab Exam

Student ID:

Student Name: _____

Date : __19/04/2016__

Time: -

For Teacher ONLY

190416

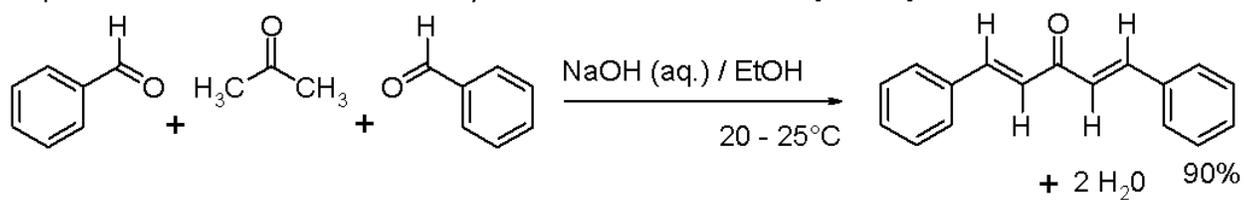
Received by _____

Date (dd/mm/yy)

Question	Possible Pts.	Mark
1	26	
2	7	
3	12	
4	13	
TOTAL	58	
Total %	100%	

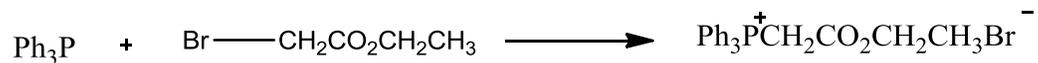
Teacher's Comments:

1. Prepare a detailed mechanism for the synthesis of dibenzalacetone. [26 mks]

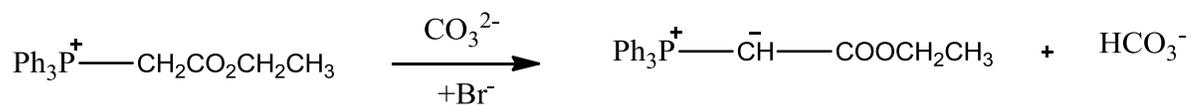


2. The Wittig synthesis of Ethyl cinnamate proceeds by the following three steps:
Write the reaction mechanisms for Steps A, B and C.

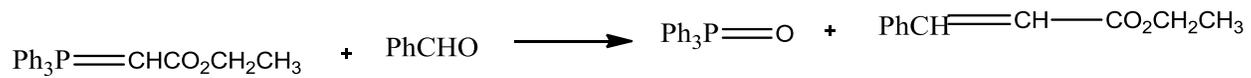
Step A. (1 mk)



Step B. (2.5 mks)



Step C. (3.5 mks)



3. A compound X gives the following IR spectral data: 2700-3300 cm^{-1} , 1725 cm^{-1} , 1600 cm^{-1} , 1450 cm^{-1} . Upon reaction with sodium borohydride followed by acidification, the product Y, with the following ^1H NMR spectral data is formed.

The ^1H NMR data for Y

^1H NMR
7.3ppm (5H), m
3.6 ppm (2 H), d
2.85, (1H), sextet
2.0 ppm (1 H), s
1.25 ppm (3 H), d

Draw the structures of the starting material, X and product Y, and assign/label the ^1H NMR signals in Y. (Hint: Molecular formula of Y is $\text{C}_9\text{H}_{12}\text{O}$)

a) Structure of X (5 mks)

b) Structure of Y (7 mks)

4. This question is related to the compound with the empirical formula $C_8H_8O_2$.
- a) From the NMR data identify the structural moieties obtained: Singlet at 3.7 ppm (3 H); multiplet at 7.2 ppm (5 H) (2 marks)
- b) From the IR data identify the functional groups in the compound: 2850 cm^{-1} (sharp), 1720 cm^{-1} , 1600 cm^{-1} , 1503 cm^{-1} (4 marks)
- c) From the MS data identify the fragments as shown in Figure 4.1 (5 marks)
- d) Give a structure for the compound. (2 marks)

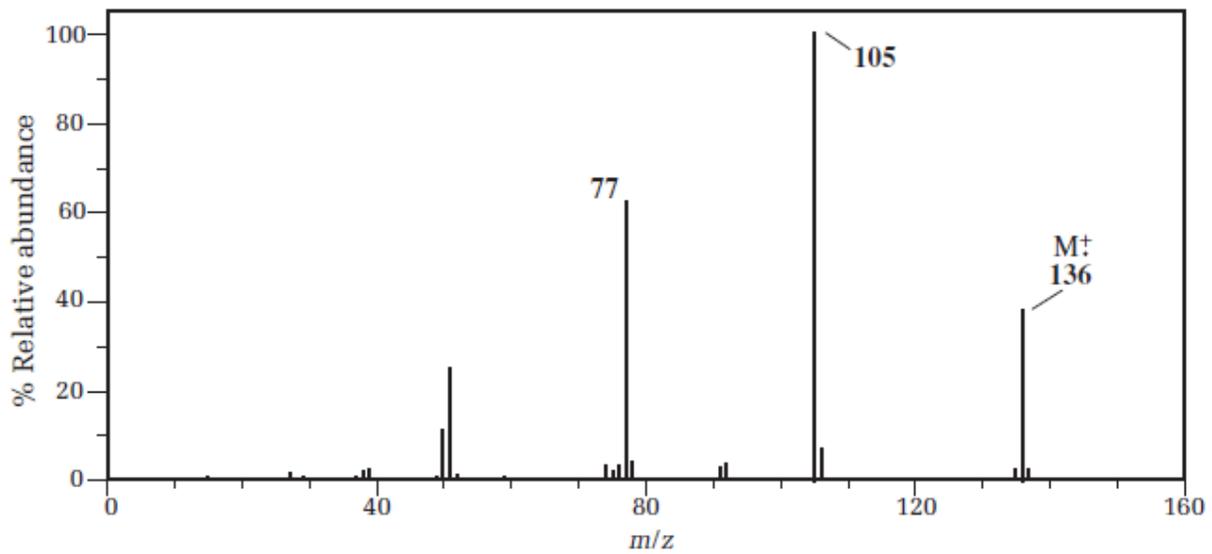


Fig. 4.1