THE UNIVERSITY OF TOLEDO 1872

CHEM 8410_6410_4410 Spring 2019 – Mid-Term Exam 3
04-16-19

Time: 10:00am – 11:15am

Student Name: _____

Student Number: _____

Instructor:	Prof. Andreana
Room #:	BO 2059

ANSWERS

TOTAL PTS POSSIBLE = 110

CHEM 8410_6410_4410 – Organic Synthesis

THE UNIVERSITY OF TOLEDO 1872

Mid-Term Exam 3

Time: 10:00 am – 11:15 am
Date: April 16, 2019
Room: BO 2059

100 Points - Total

Problem 1: Please provide mechanisms for 5 of the following 10 named reactions: (**25 Points**) - * indicates this named reaction MUST be one of your 5.

Favorskii Rearrangement	*Milas Hydroxylation Reaction
*Mitsunobu Reaction	Mannich Reaction
Pictet-Spengler Isoquinoline	Kolbe-Schmitt
Fries Rearrangement	Hammick Reaction
Quelet Reaction	Rosenmund Reduction

Answer(s):

PLEASE SEE YOUR NOTES

Use back of sheet if need be and blank paper→→→→→→→→→→→→→→→→→→→→→→→→→→→→→→

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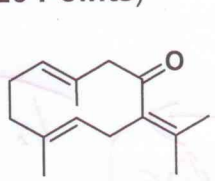
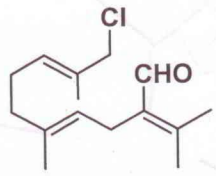
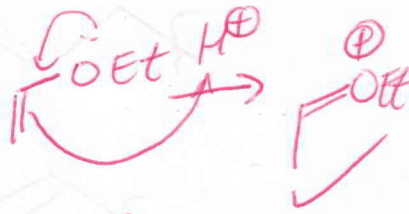
Problem 2: How do you synthesize the T.M. noted in the figure below? Please provide mechanisms for every step you use. The starting material is given. You should have no more than 5 steps for a perfect score. (**20 Points**)



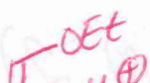
T.M.



Starting Material

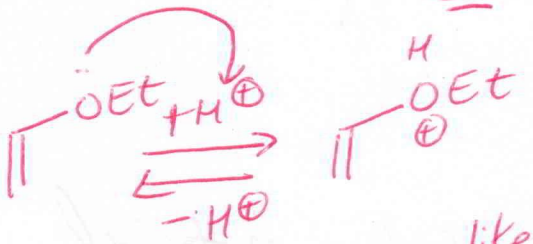


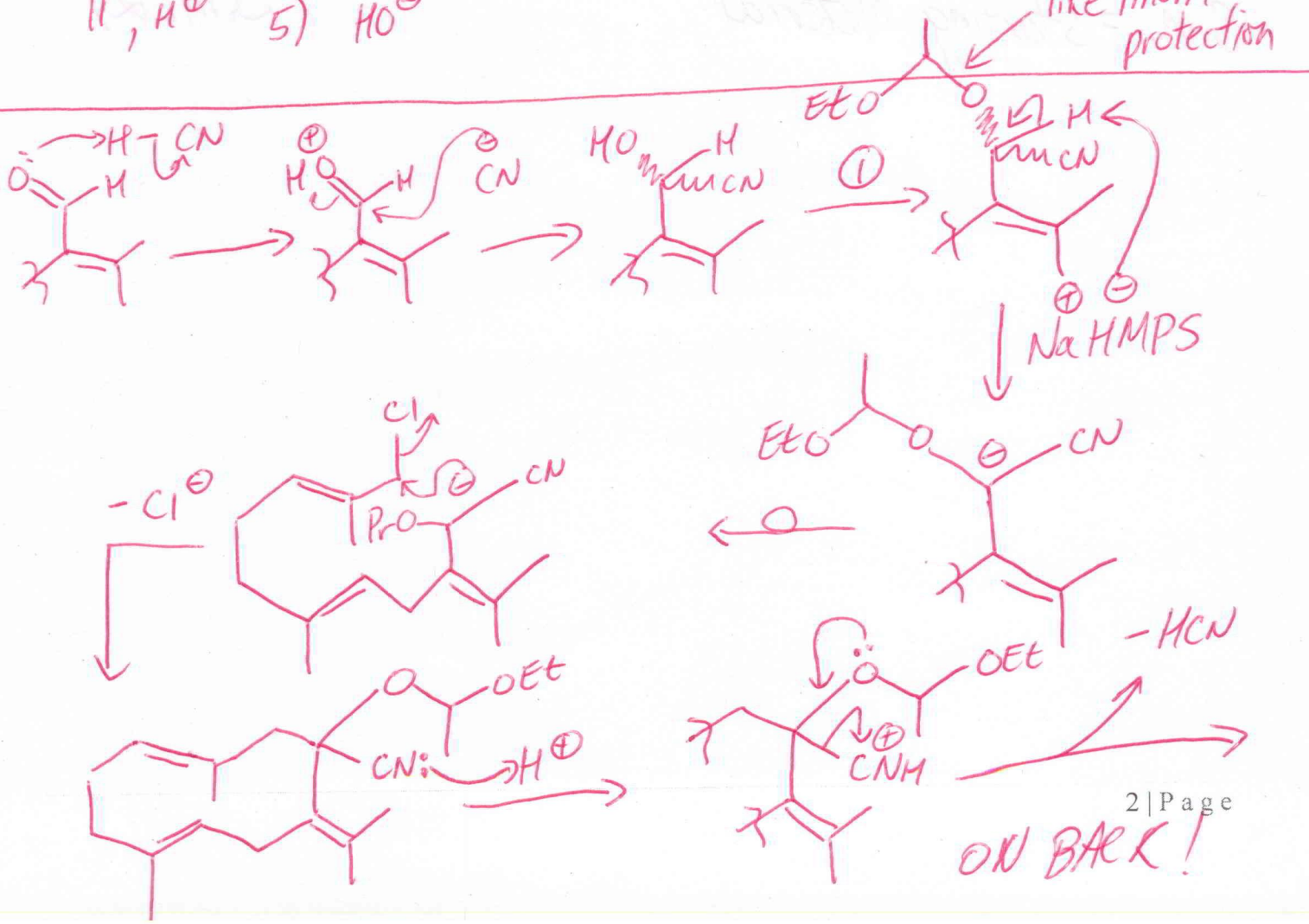
Answer: Benzoin-Type

1) HCN
2) 

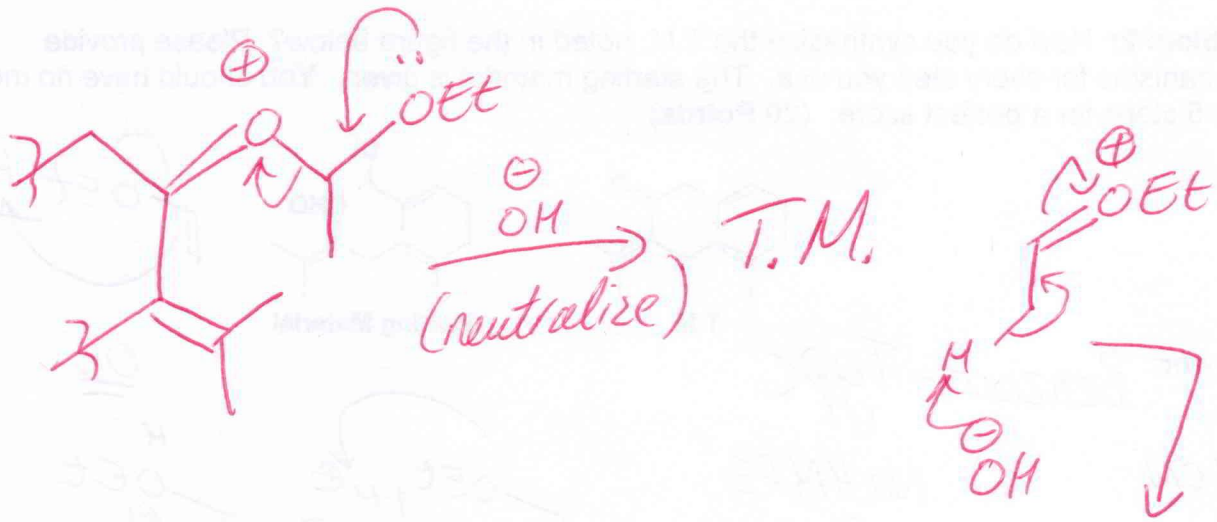
3) NaHMPS
4) $H^{\oplus}$
5) $HO^{\ominus}$

OR





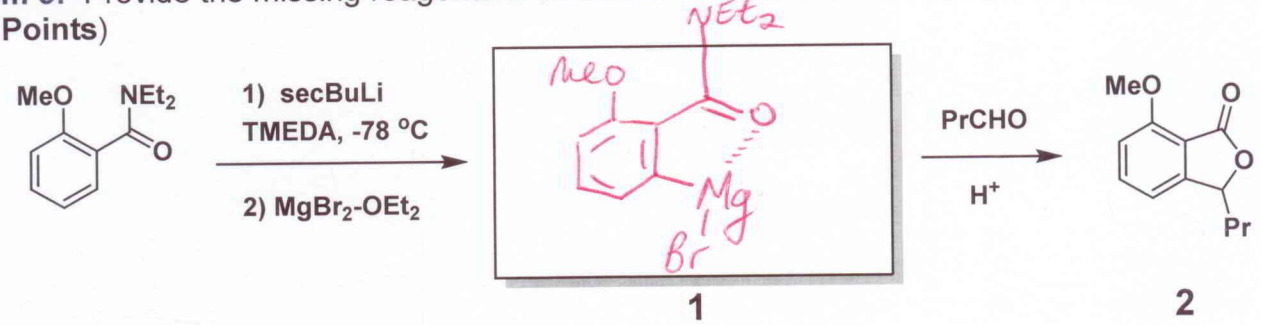
ON BACK!



S.M. = starting material

S.M. 2)

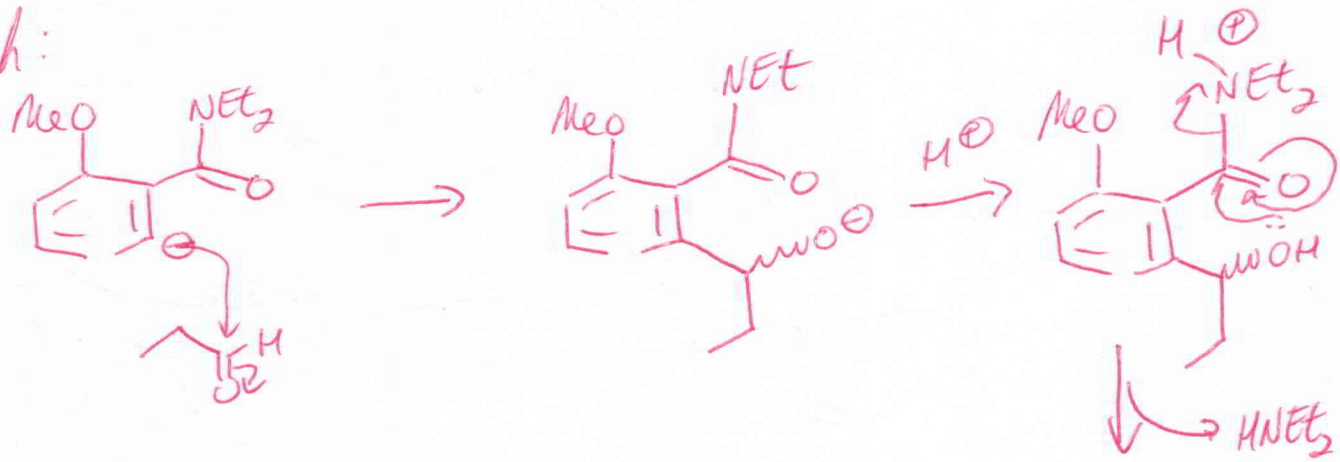
Problem 3: Provide the missing reagents or structures. Provide a mechanism for compound **1** – **2**. (**20 Points**)



1 **2**

Answer:

Mech:



T.M.

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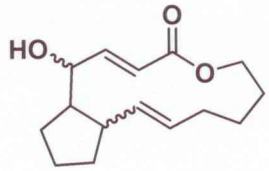
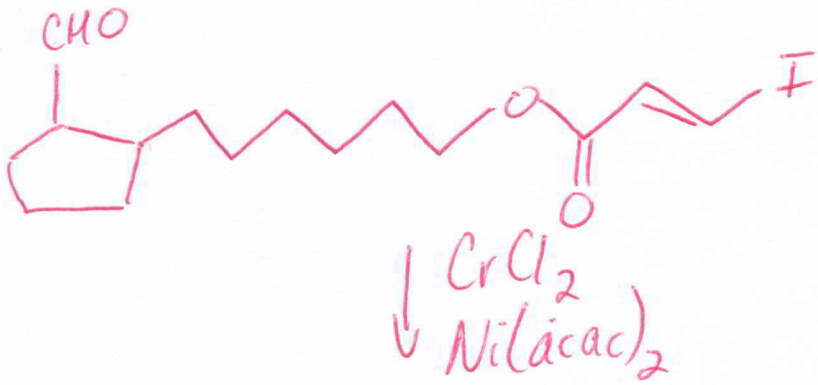
Problem 4: One common theme in this year's class has been on synthesizing macrocyclic ring structures from acyclic precursors. From the acyclic precursor, in one step, how do you synthesize the macrocyclic lactone shown below? No mechanism required. (**5 Points**)



Answer:

Kishi - Nozaki



T.M.

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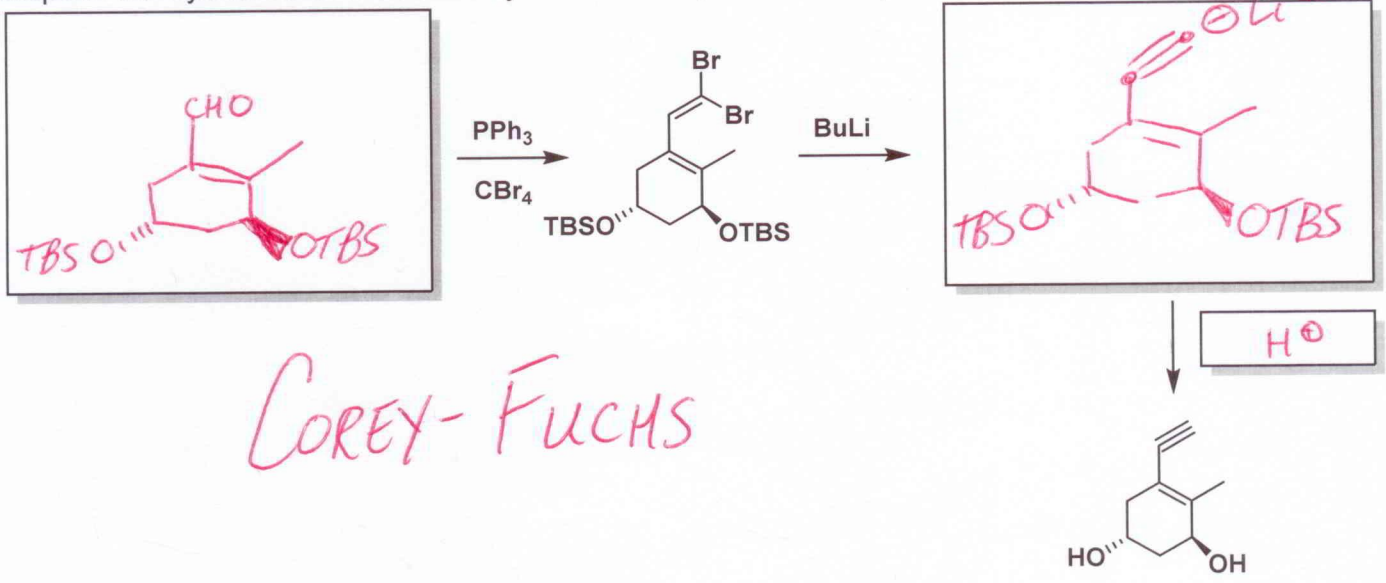
Problem 5: A small "road-map" is given below. Please provide either the reagents or structures necessary to get to the final synthon as noted below. Is there a name associated with any of the steps in the synthesis of the noted synthon? If so, what is it? (**10 Points**)



COREY-FUCHS

Answer:

See above in boxes

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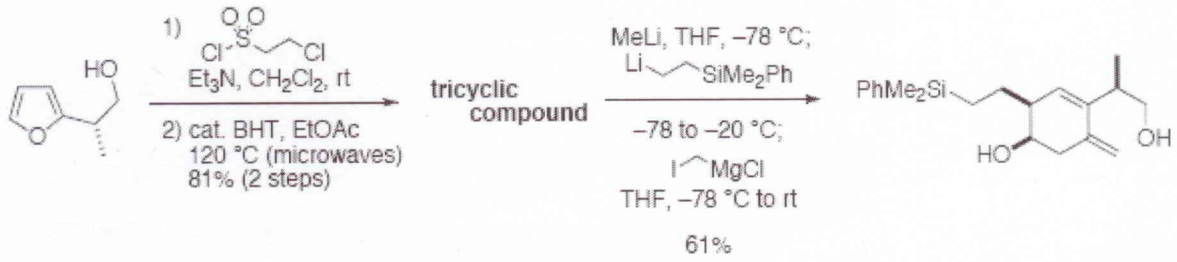
Problem 6: Provide the mechanisms for the following transformations. Clearly identify the tricyclic compound intermediate. (**10 Points**)



M. Takase
P. Metz *et al.*, *Angew. Chem. Int. Ed.*, **43**, 5991 (2004)

Answer:

PLEASE SEE PROBLEM SET #3

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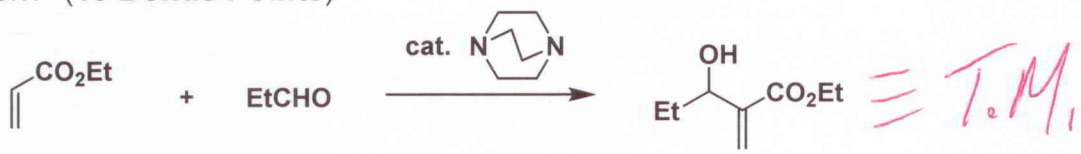
Problem 7: Provide the mechanism for the following transformation. (**10 Points**) What is the name of this reaction? (**10 Bonus Points**)



Answer:

BAYLISS-HILLMANN (10 PTS)

PLEASE SEE GROSSMAN

HMWK ASSIGNMENT