

Modern Organic Chemistry

07-2012

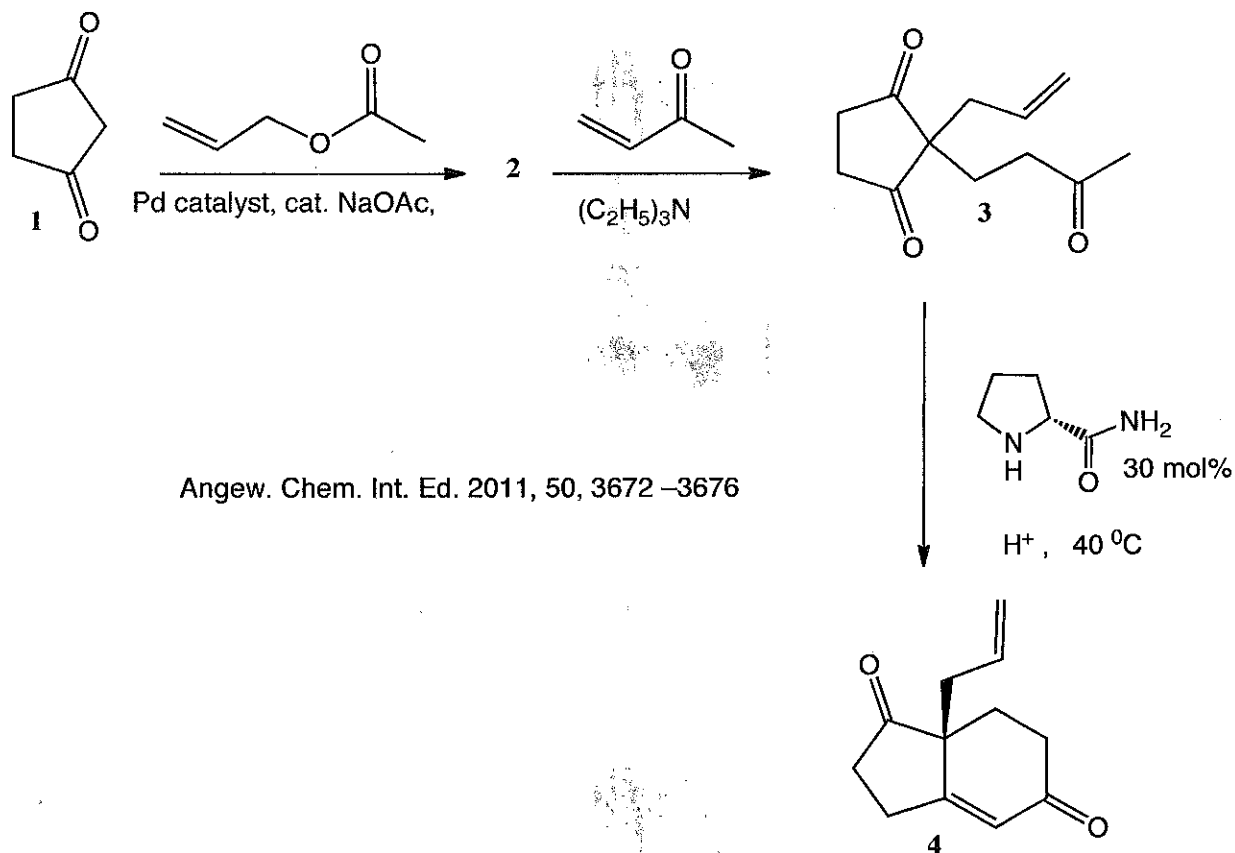
time: 3 uur

Every answer sheet must be provided with your name, study and student number

(The maximum points for every question is indicated)

question 1.(20 points)

Part of the synthetic route to (-)-Jiadifenolide is shown in the scheme.



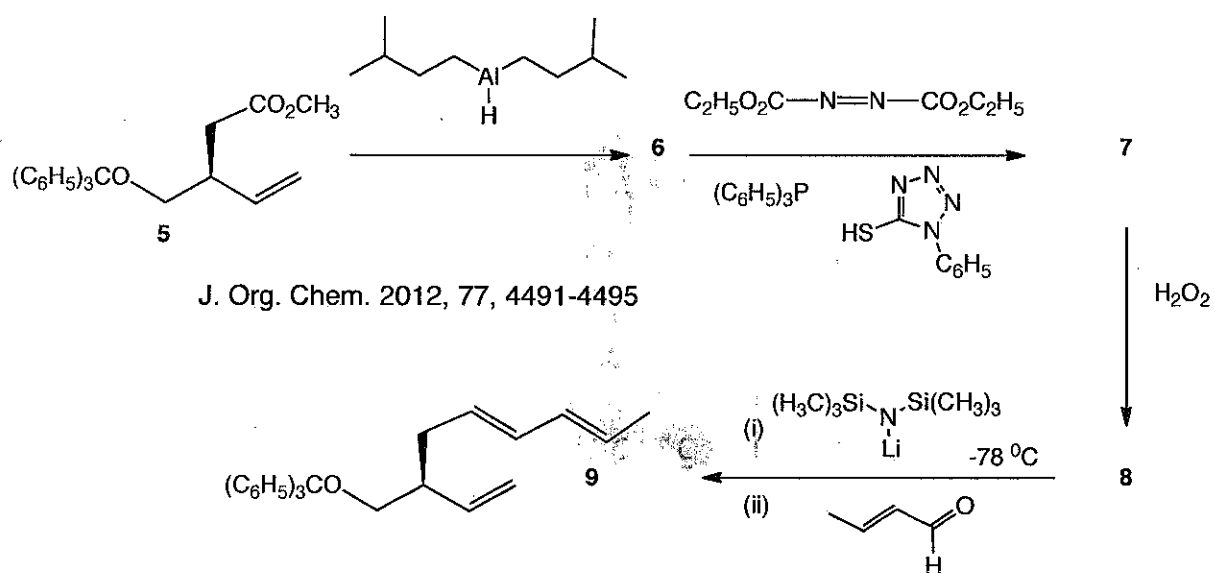
a) Provide the structure of compound **2** and the mechanism of the corresponding reaction.

b) Provide the mechanism of the conversion of **2** into **3**.

c) Provide the mechanism of the conversion of **3** into **4**. The stereochemistry in **4** does not need to be explained.

Question 2. (20 points)

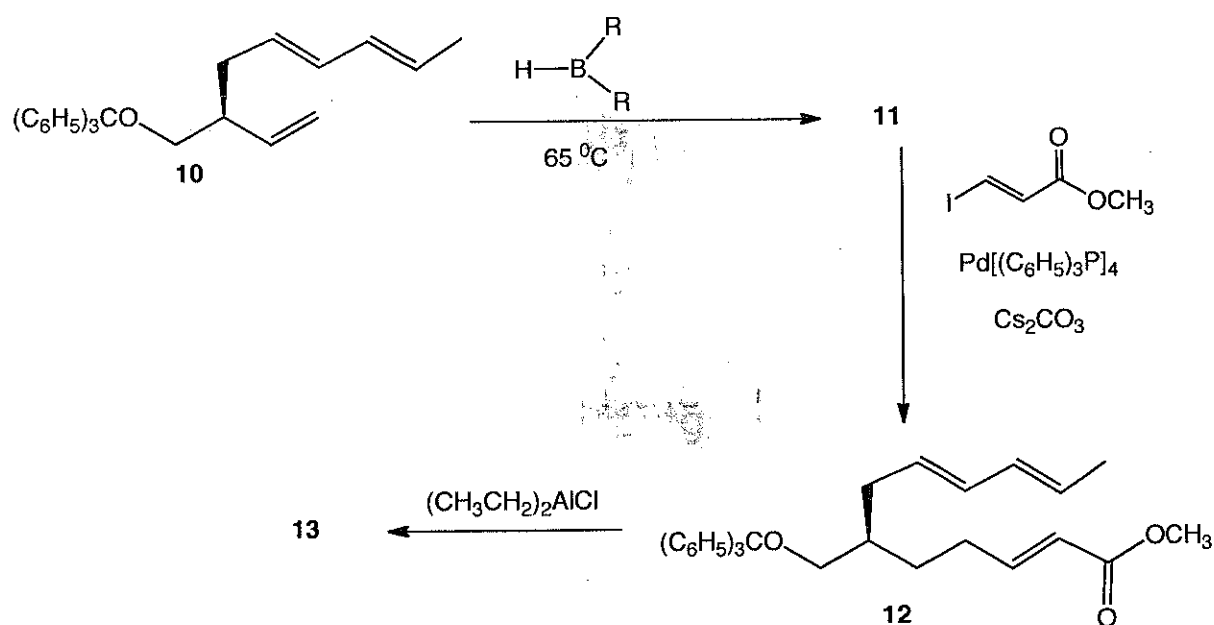
Part of the synthetic route to Apiosporic Acid is depicted in the scheme.



- Provide the structure of compound **6** and the mechanism of the corresponding reaction.
- Provide the structure of compound **7** and the mechanism of the corresponding reaction.
- Provide the structure of compound **8** and the mechanism of the corresponding reaction.
- Provide the mechanism of the conversion of **8** into **9**.

Question 3. (20 points)

Another part of the synthetic route to Apiosporic Acid is depicted in the scheme.



a) Provide the structure of compound **11** and the mechanism of the corresponding reaction.

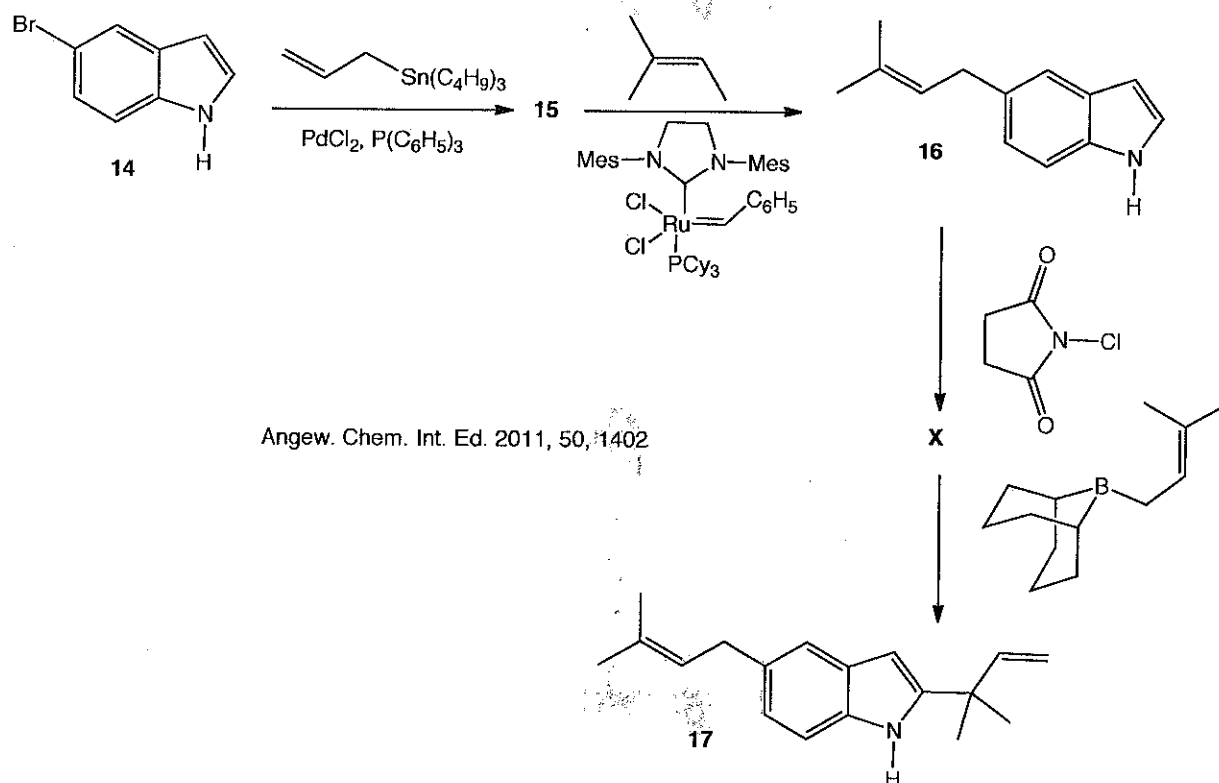
b) Provide the mechanism of the conversion of **11** into **12**.

Treatment of **12** with the mild lewis acid diethylaluminium chloride led to an intramolecular reaction.

c) Provide the structure of compound **13** (including the stereochemistry) and the mechanism of the corresponding reaction.

Question 4. (20 points)

Part of the synthetic route to Variocolortides is depicted in the scheme.



a) Give the structure of **15**.

b) Provide the mechanism of the conversion of **15** into **16**.

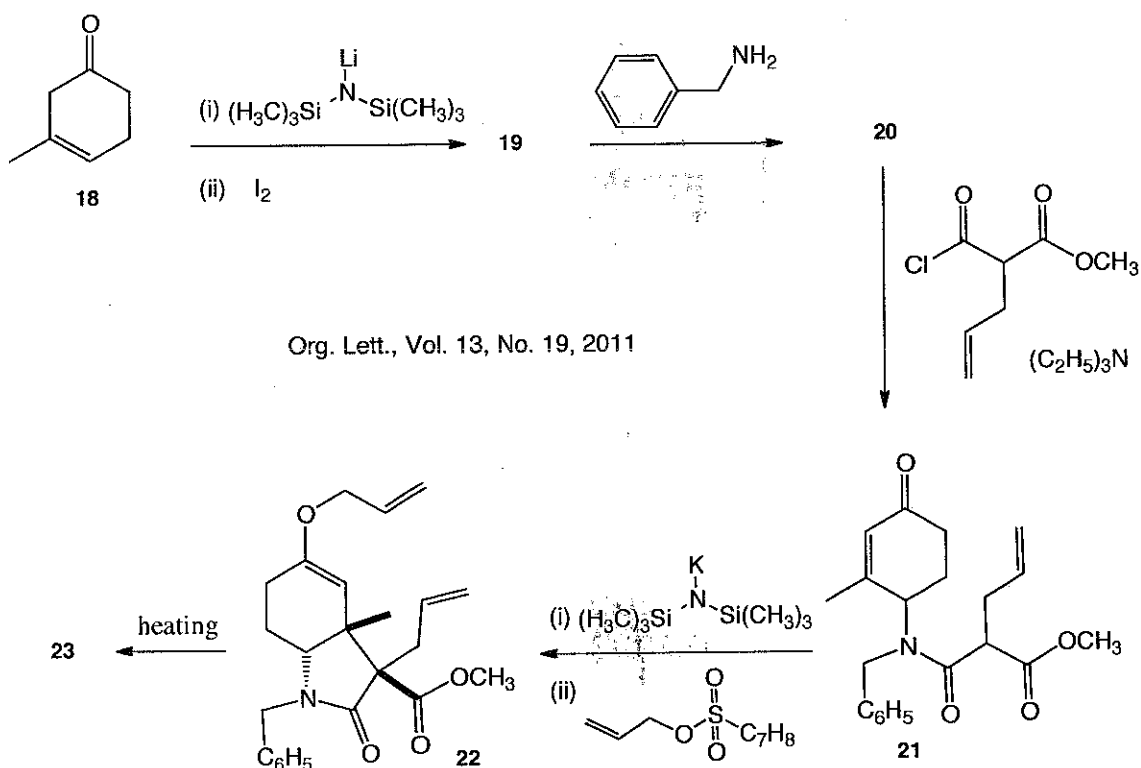
Treatment of **16** with N-chlorosuccinimide leads to unstable intermediate **x**, which upon addition of prenyl-BBN leads to product **17**.

c) Provide the structure of **x** and the mechanism of its formation.

d) Provide the mechanism of the conversion of **x** into **17**.

Question 5 (25 points)

Part of the synthetic route to calyciphylline A-Type skeleton is depicted in the scheme.



- Provide the structure of compound **19** and the mechanism of the corresponding reaction.
- Provide the structure of compound **20** and the mechanism of the corresponding reaction
- Provide the mechanism of the conversion of **20** into **21**.

Treatment of **21** with the base KHMDS, followed by addition of allyltosylate gave **22**.

- Provide the mechanism of the conversion of **21** into **22**.

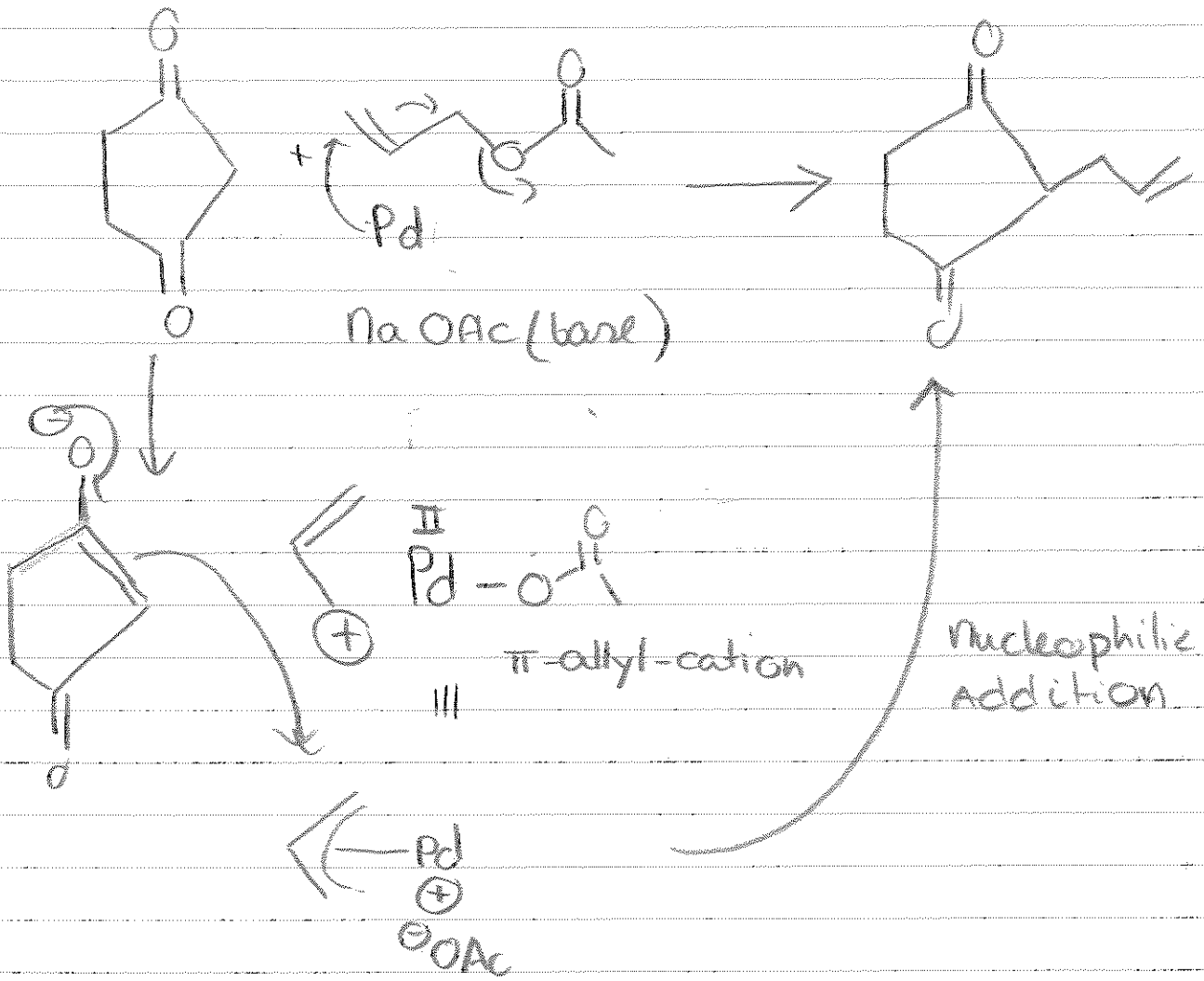
Refluxing of **22** in a high boiling solvent led to the formation of **23**.

- Provide the structure of compound **23** and the mechanism of the corresponding reaction.

Q 1

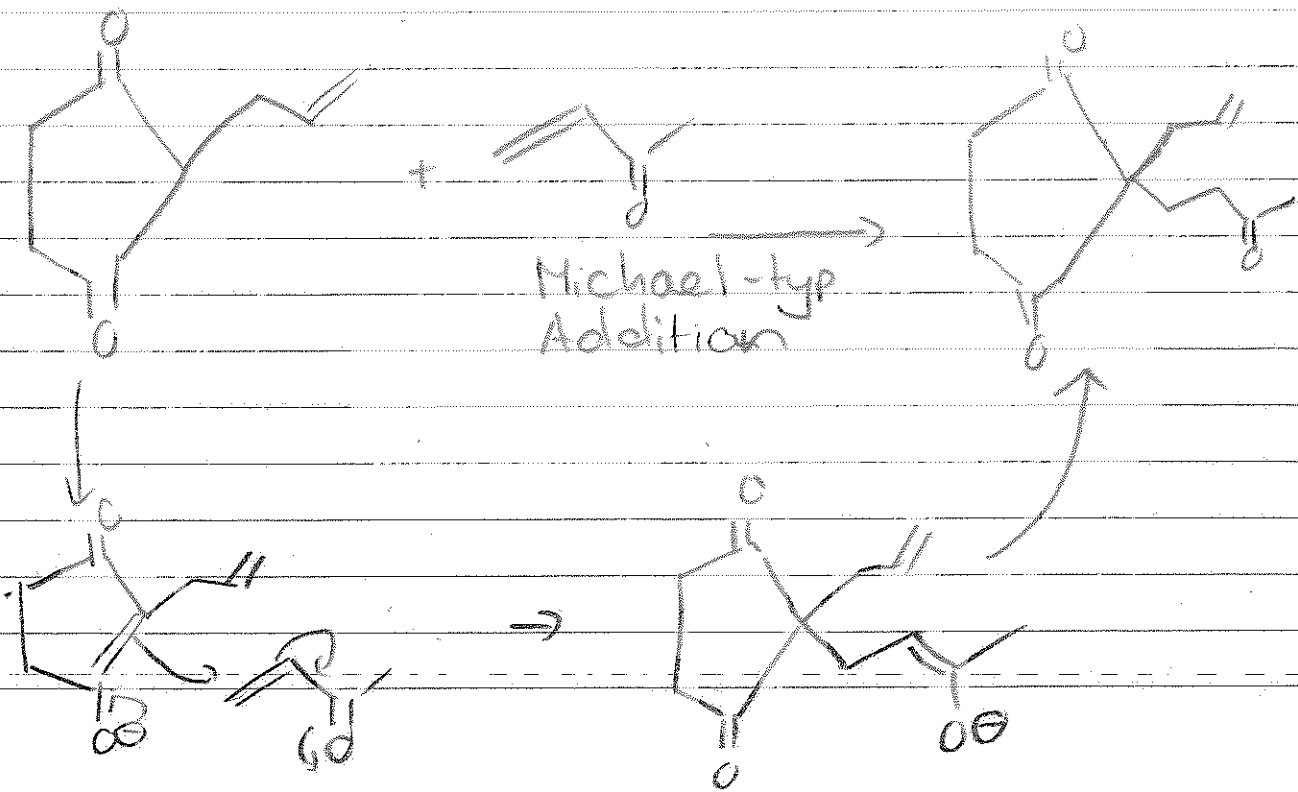
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(A)
p1331

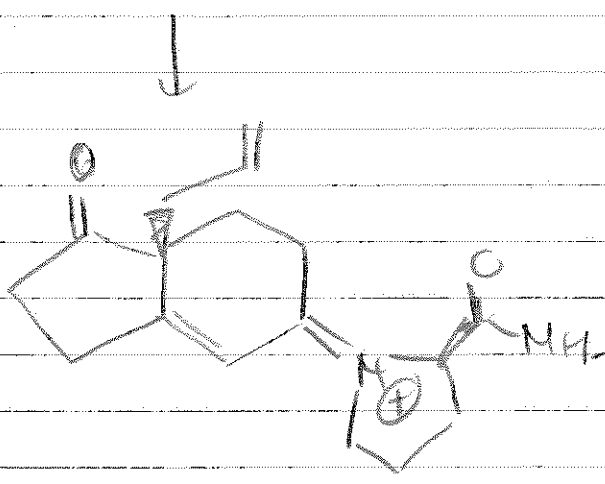
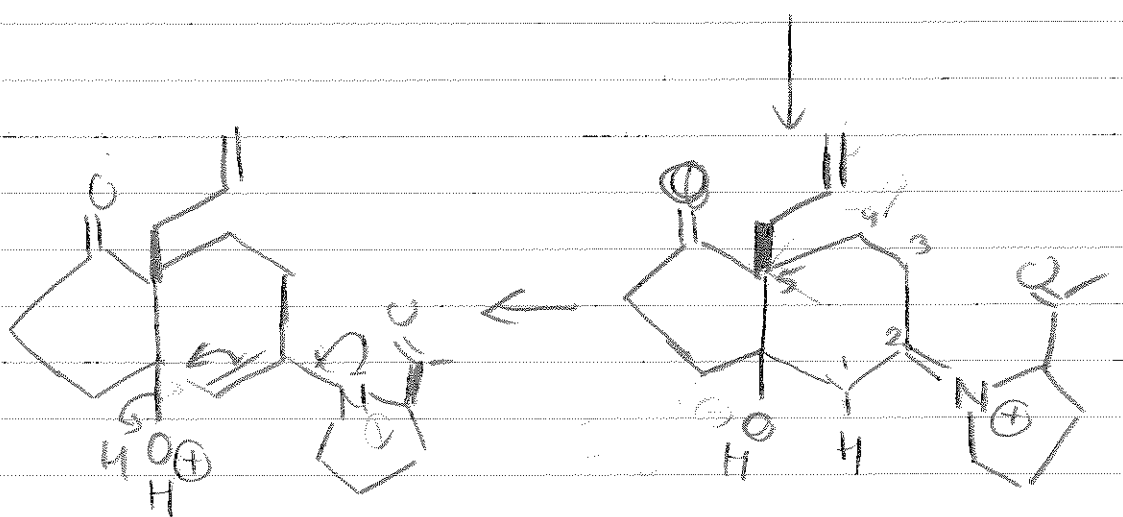
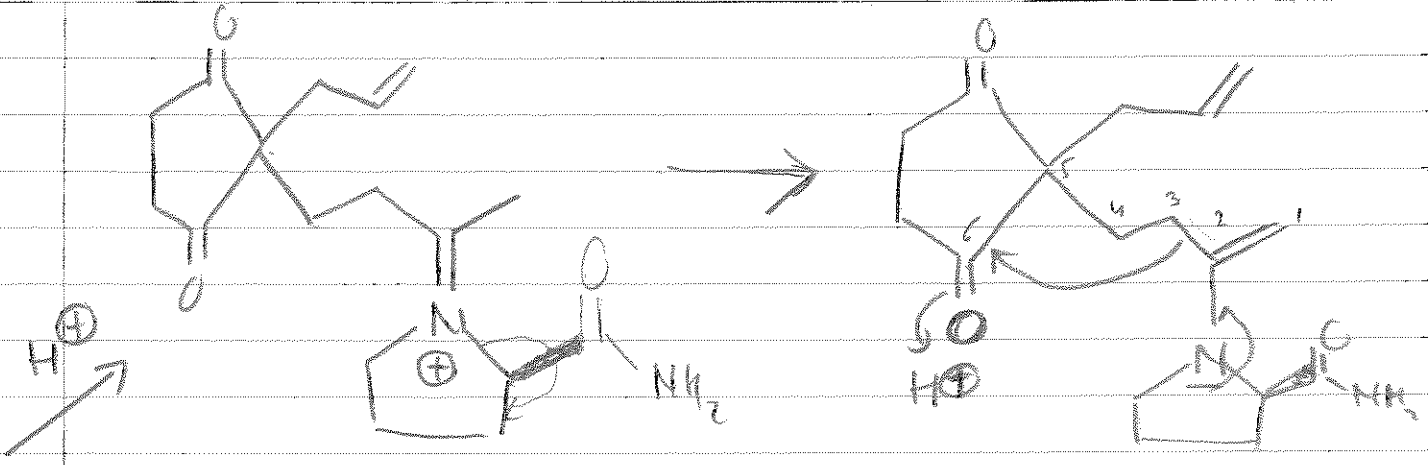


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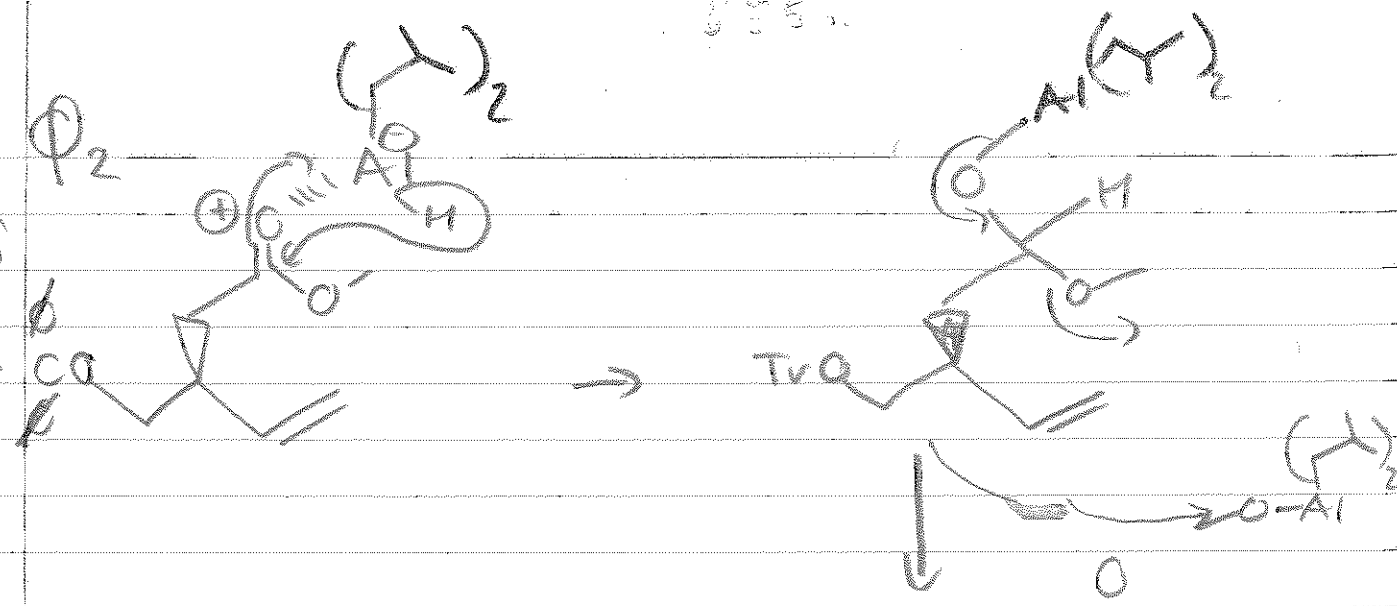
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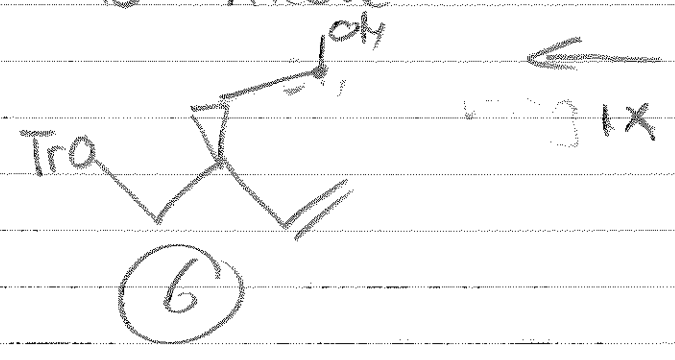
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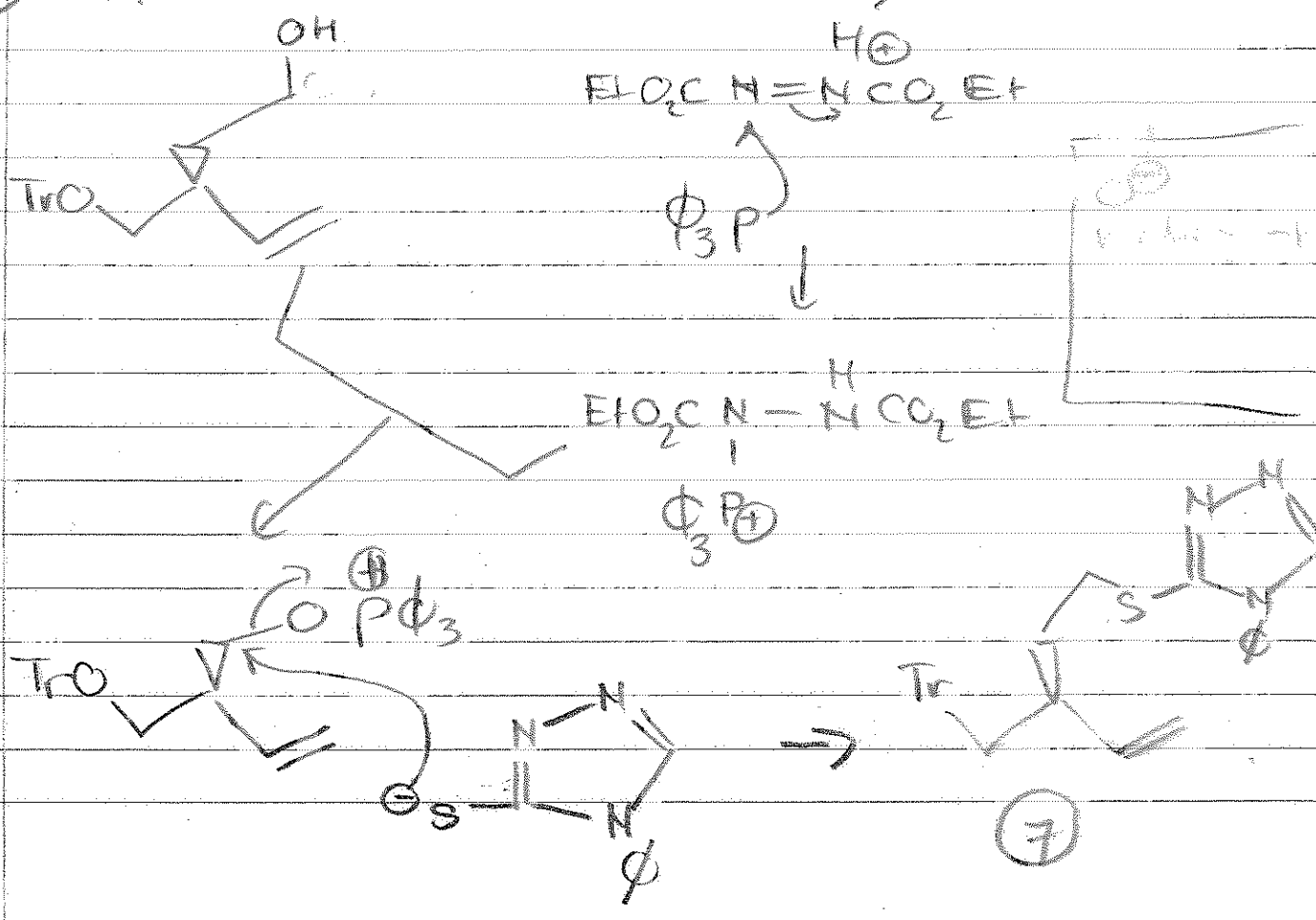


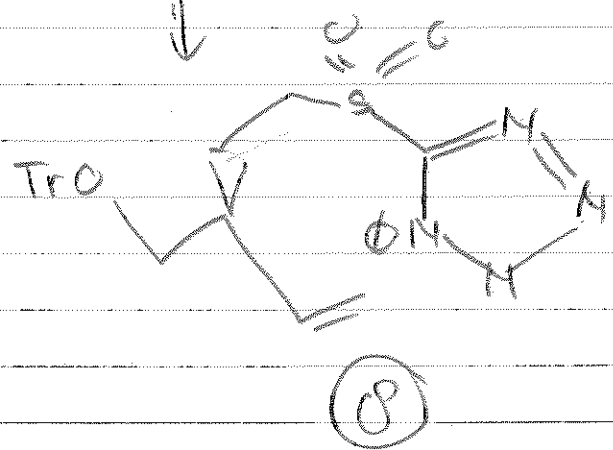
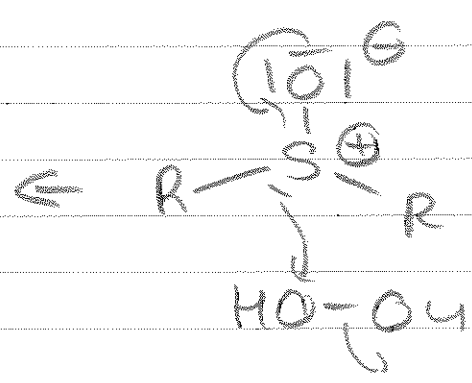
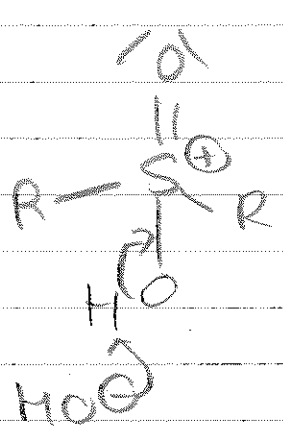
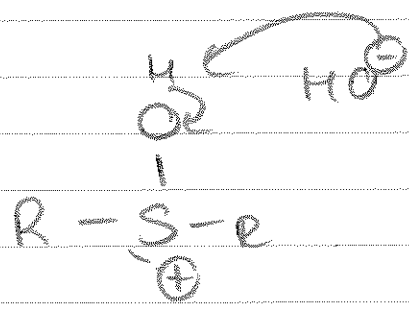
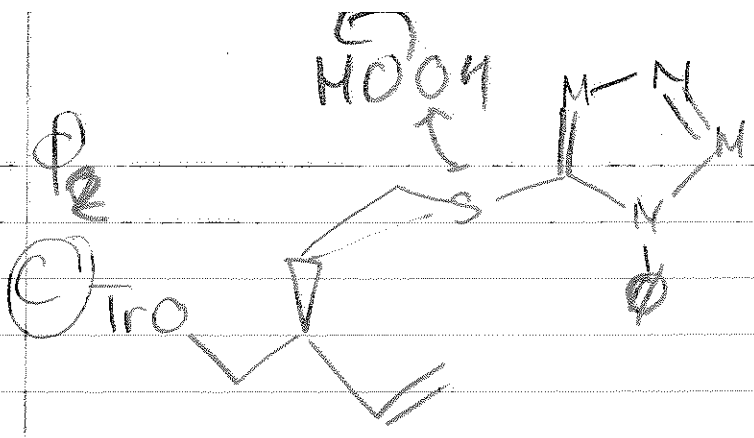
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(B)

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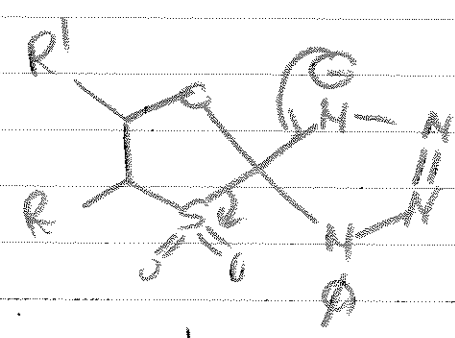
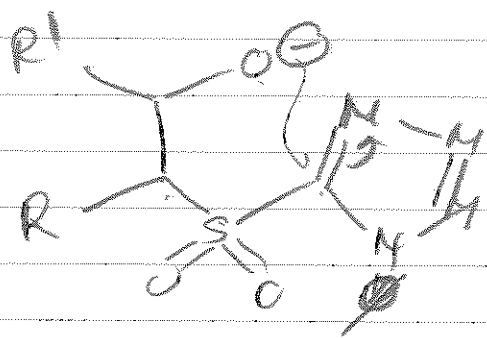
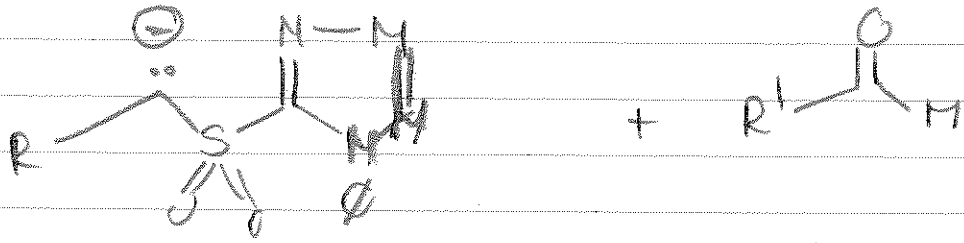
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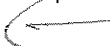
Q2

Julia

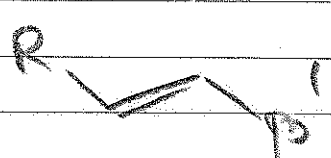
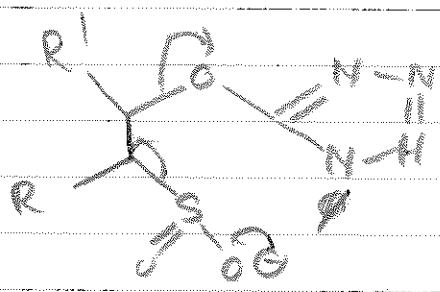
(D)



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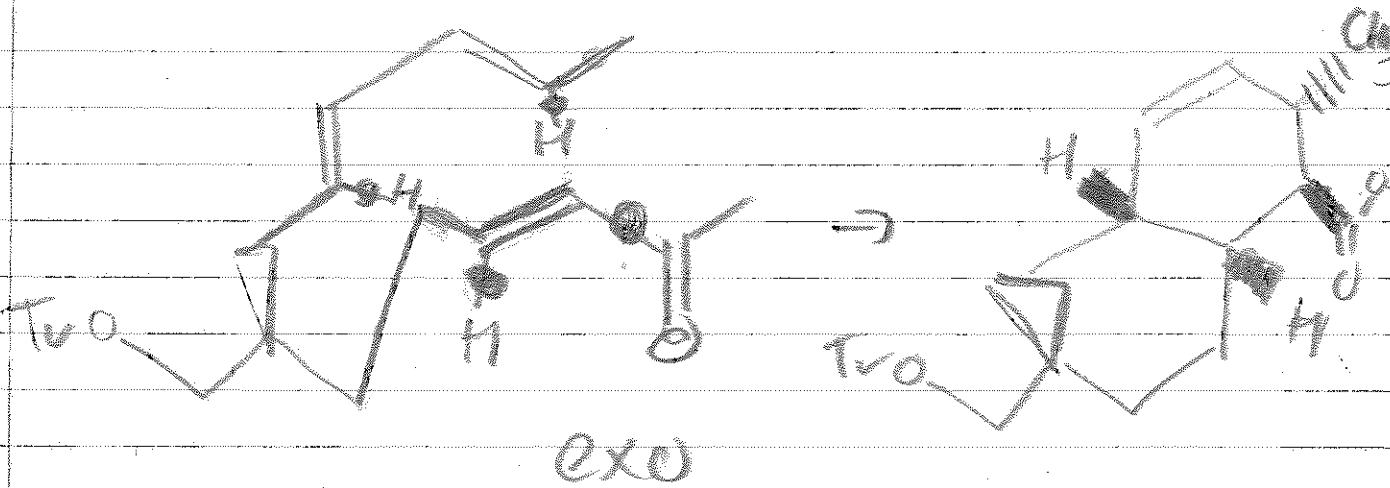
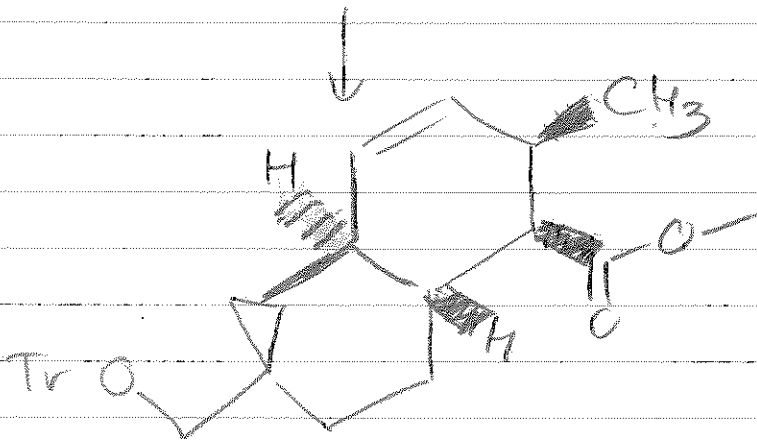
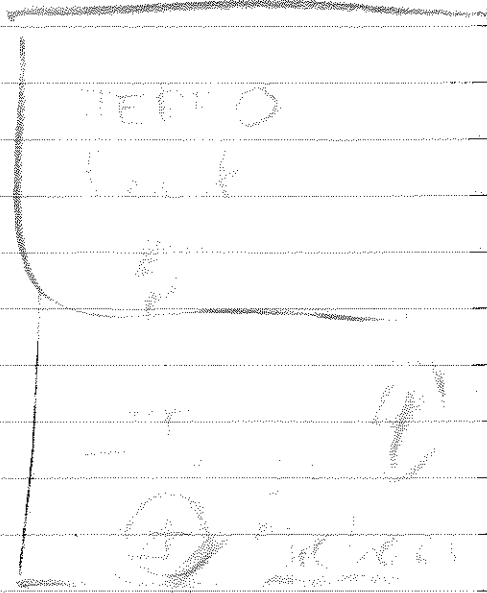
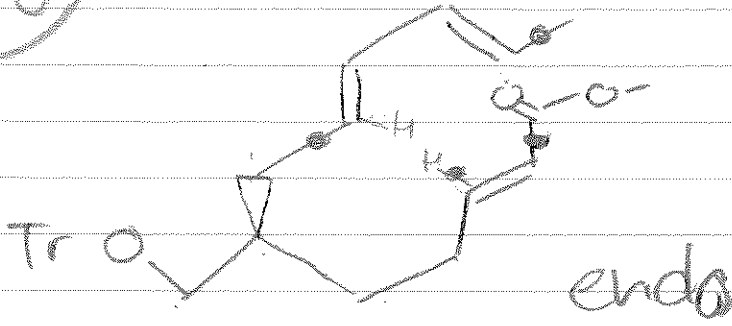


(E)



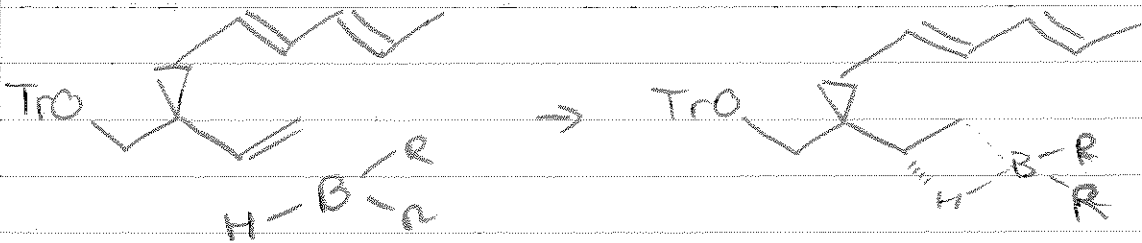
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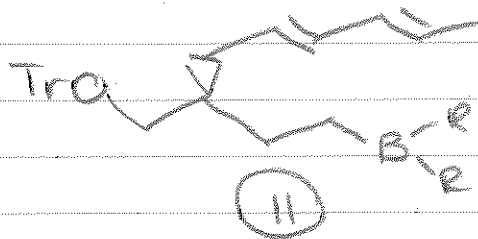
Q3

(A)



Hydroboration

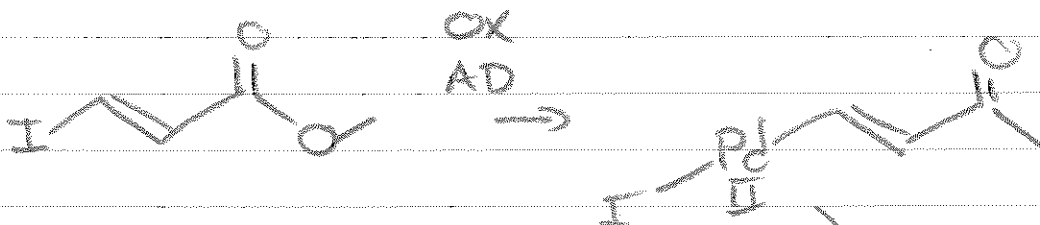
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(5)

(B)

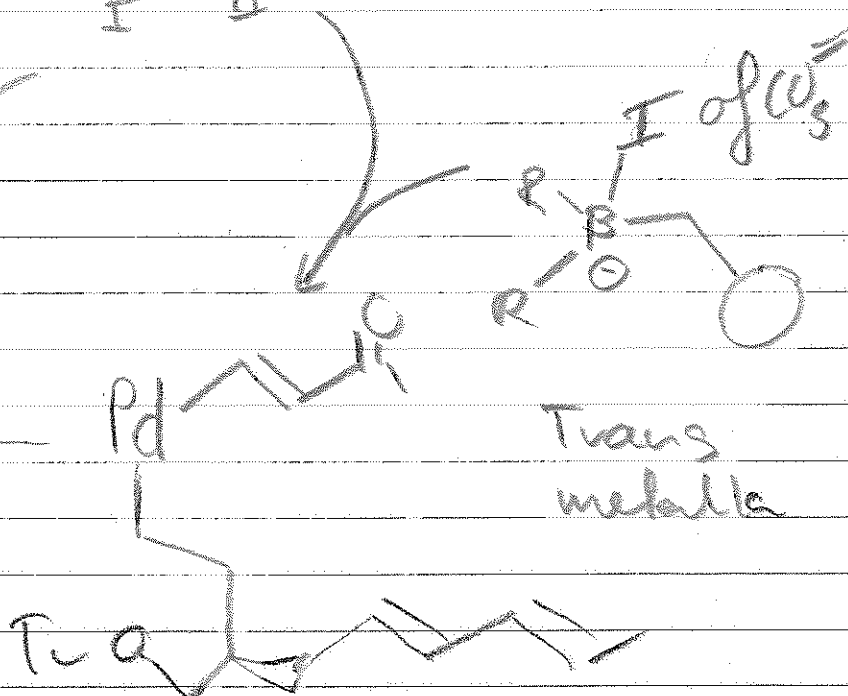
Suzuki (P1325 // 1320-29)



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(12)

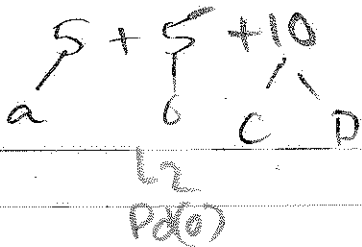
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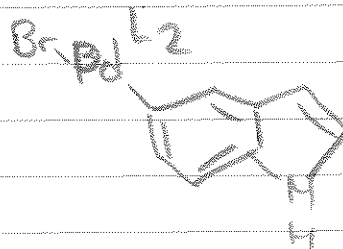
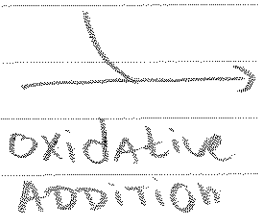
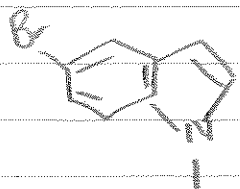
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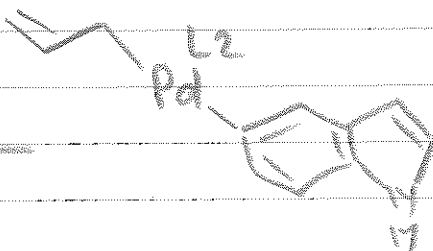
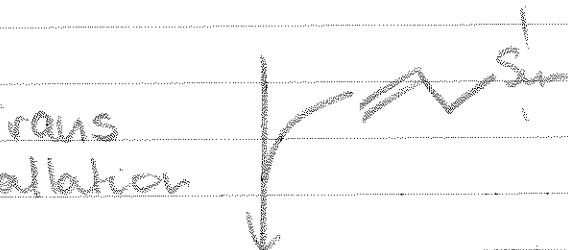


(A)

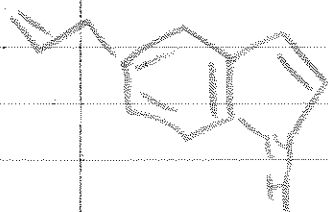


TRANS
METALLATION

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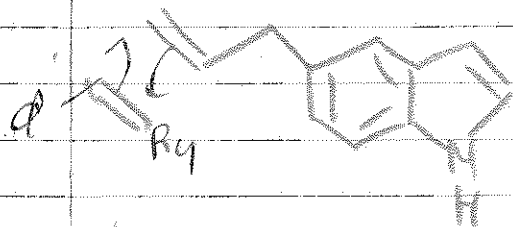


Red Elimination

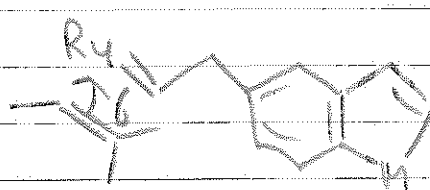
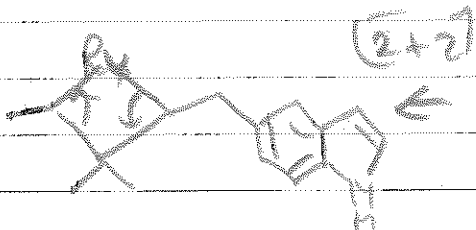
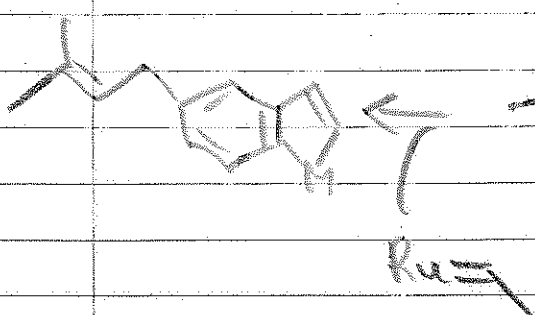
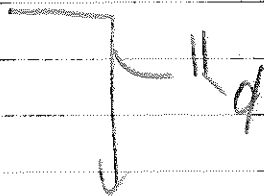


(B)

Grubbs Metathesis



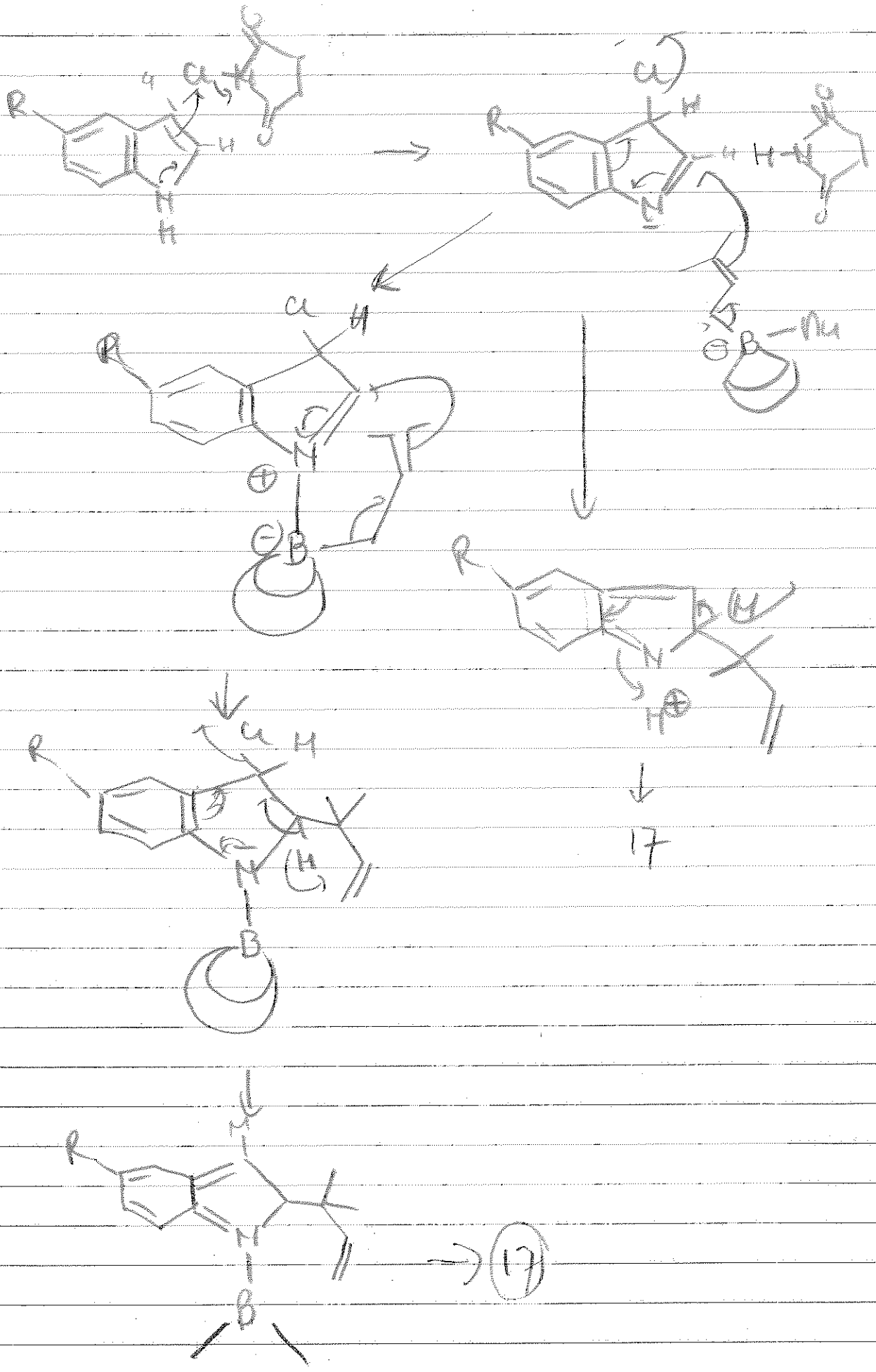
Retro



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Q4

(c)

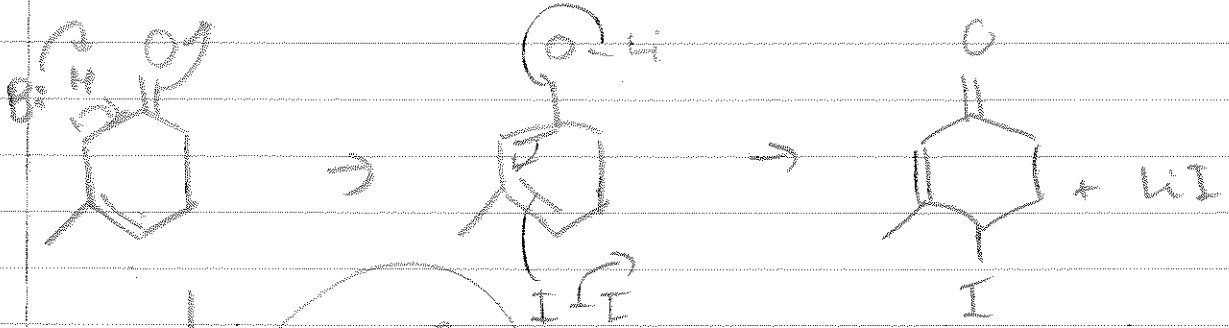


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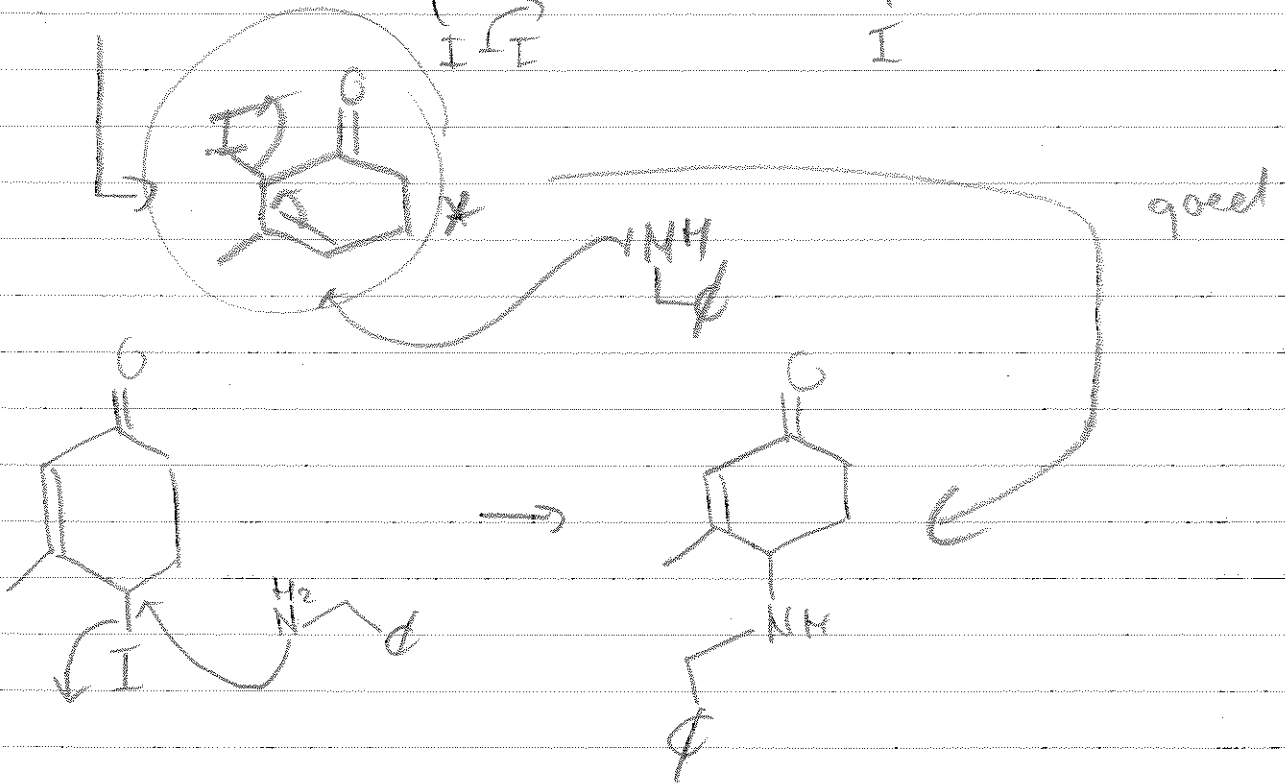
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$5 + 5 + 5 + 5 + 5$

(A)



(B)



(C)

