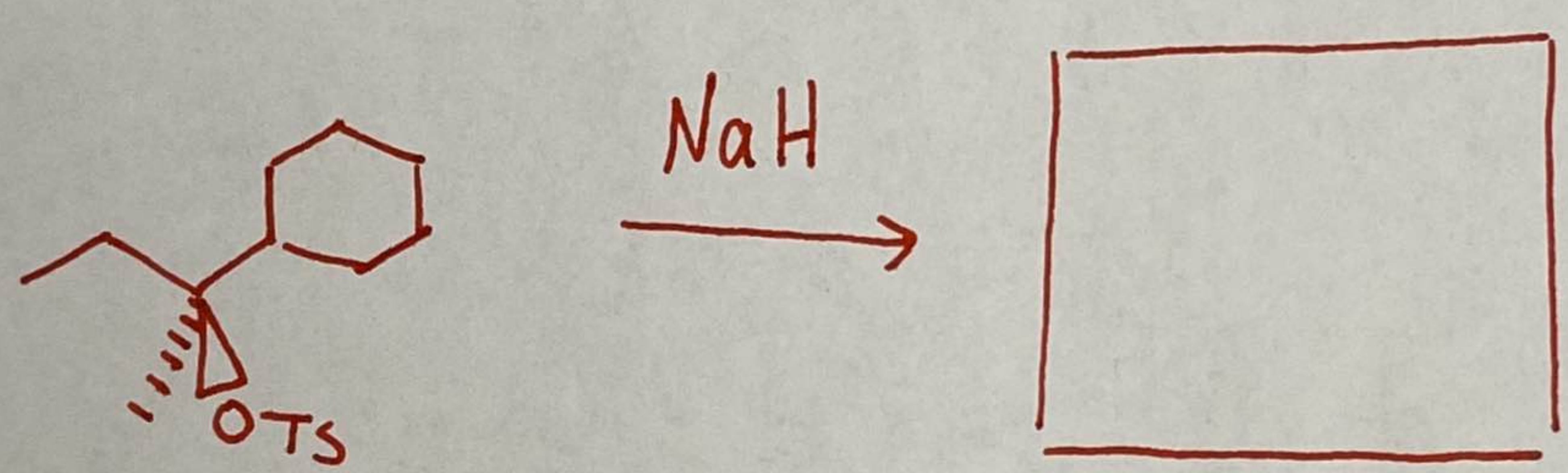
Chemistry 204 Midterm 1 SL review

(3) 1) Demonstrate retrosynthetic analysis and synthesize ethane from ethyne. Then synthesize ethyne from ethane (recall how to make a pi bond and do that twice)

$- \Leftarrow$

$\equiv \Leftarrow$

(1) 2 a) Fill in the box with all expected products. The starting material is just one enantiomer. Why did I tell you that?



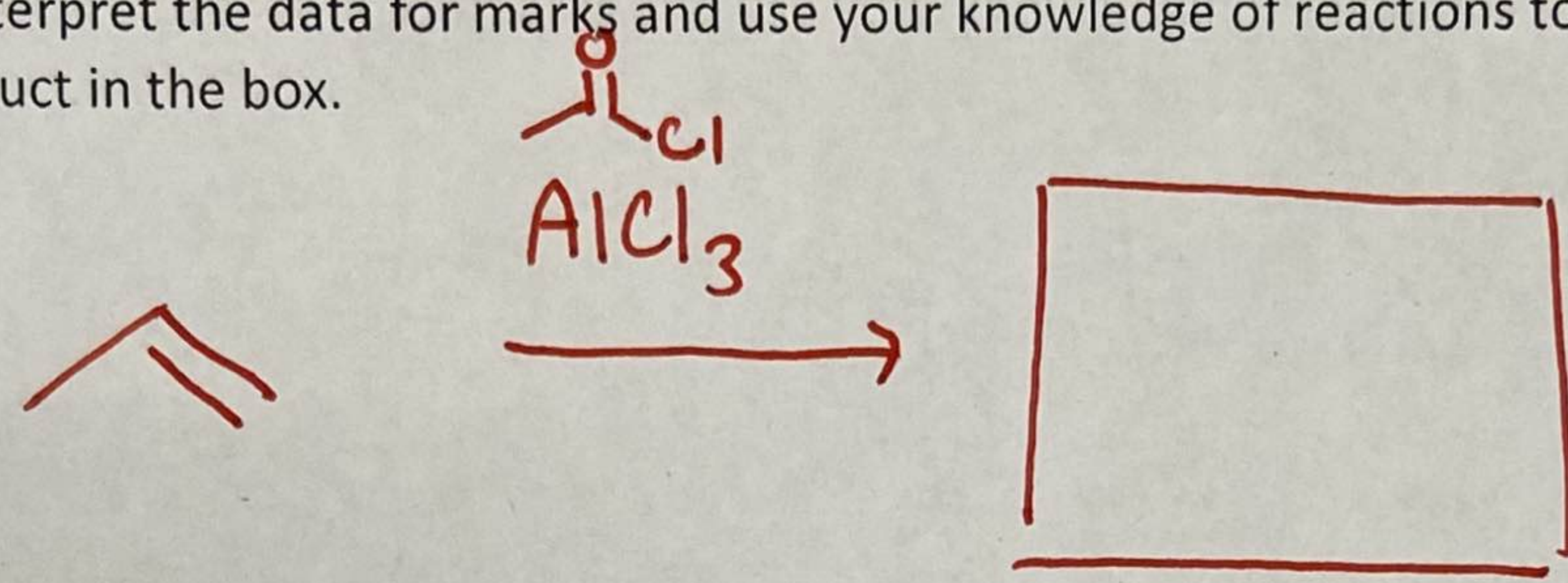
(3) b) What type of reaction was the reaction in 2 a) S_N1 E_1 S_N2 E_2

Fully Explain Reasoning

(2) c) define and give an example of a polar protic solvent. What would be the expected products in a polar protic solvent.

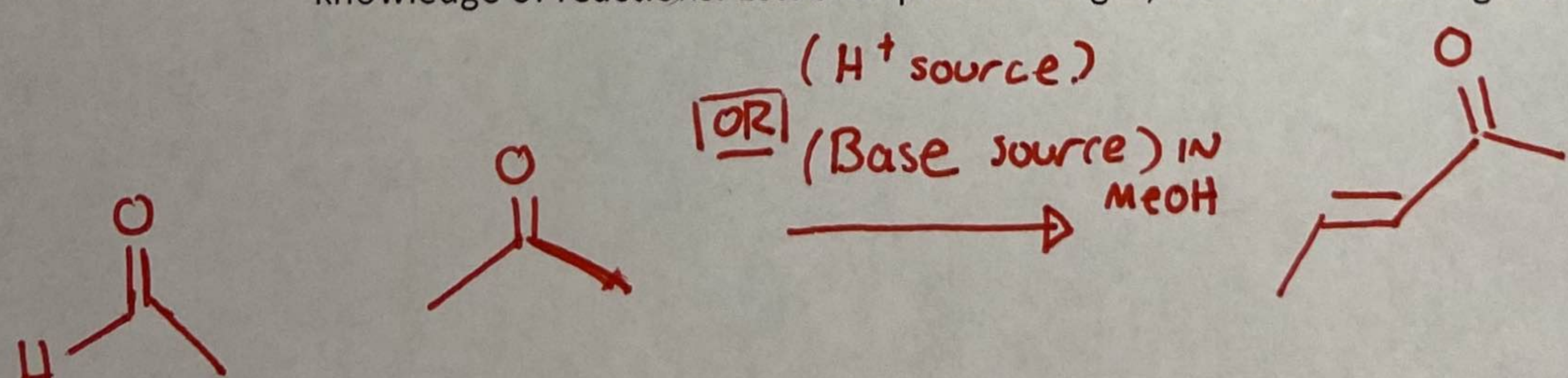
3) A hypothetical reaction with propene (shown below) that yields the following NMR data: ^{13}C BB (ppm): 198, 144, 132, 28, 19. 90° DEPT ^{13}C NMR (ppm): 144, 132.

(3) a) interpret the data for marks and use your knowledge of reactions to draw the expected product in the box.



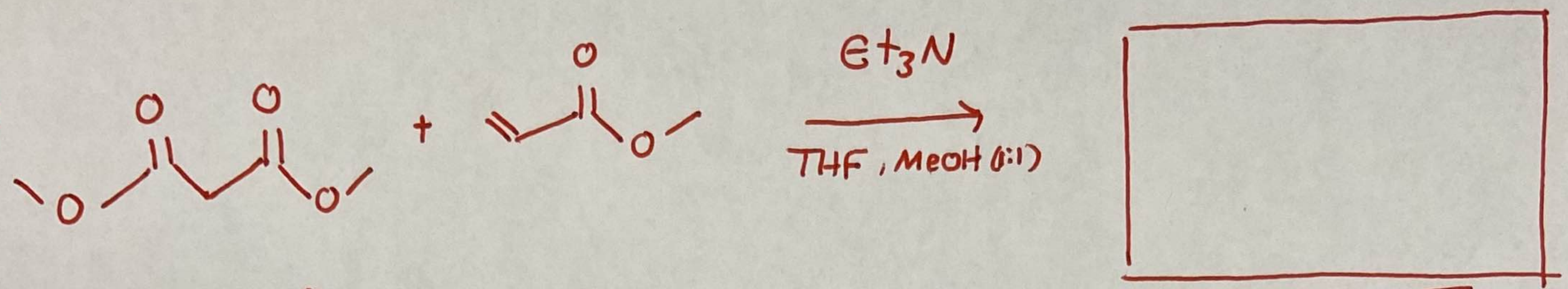
(4) b) draw the mechanism for the reaction showing any intermediates leading to final product. Take it step by step. No rush.

(5) 5) using your knowledge of reactions propose a mechanism from start to finish for the aldol condensation. You do not need to know anything about the aldol condensation. Use your knowledge of reactions. Establish partial charges, 2 in 2 out. You've got this. Choose either an H^+ source or Base (KOtBu e.g.) or Try both. will get the same product.

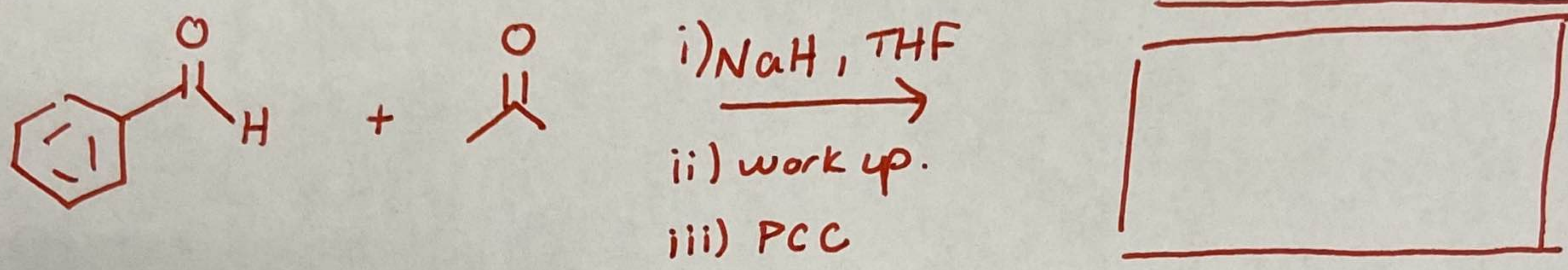


(3) 6) Using your knowledge of reactions show the product of the following reaction fill in the box.

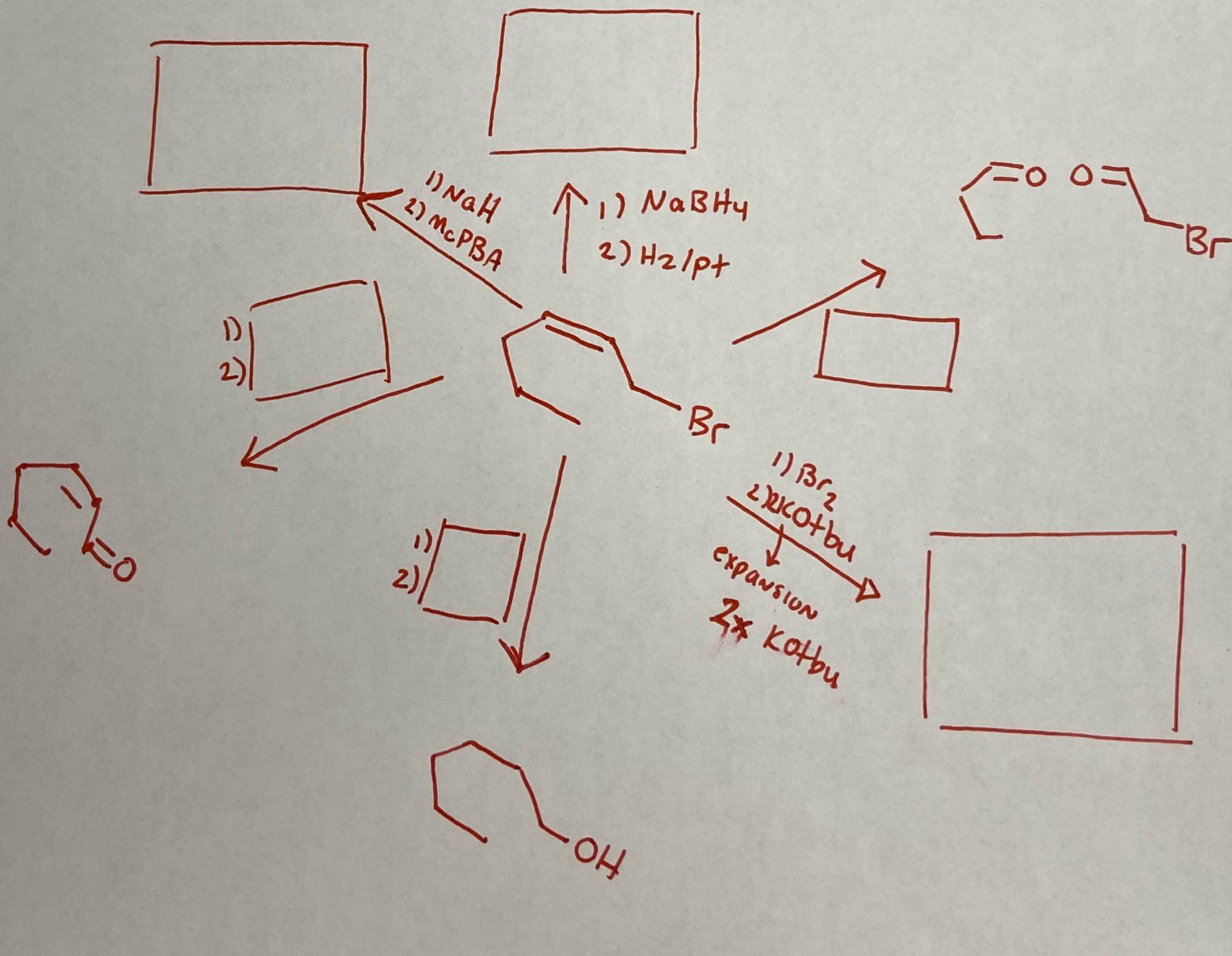
a)



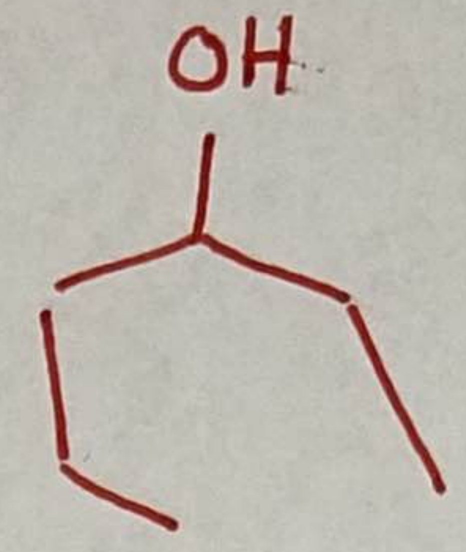
b)

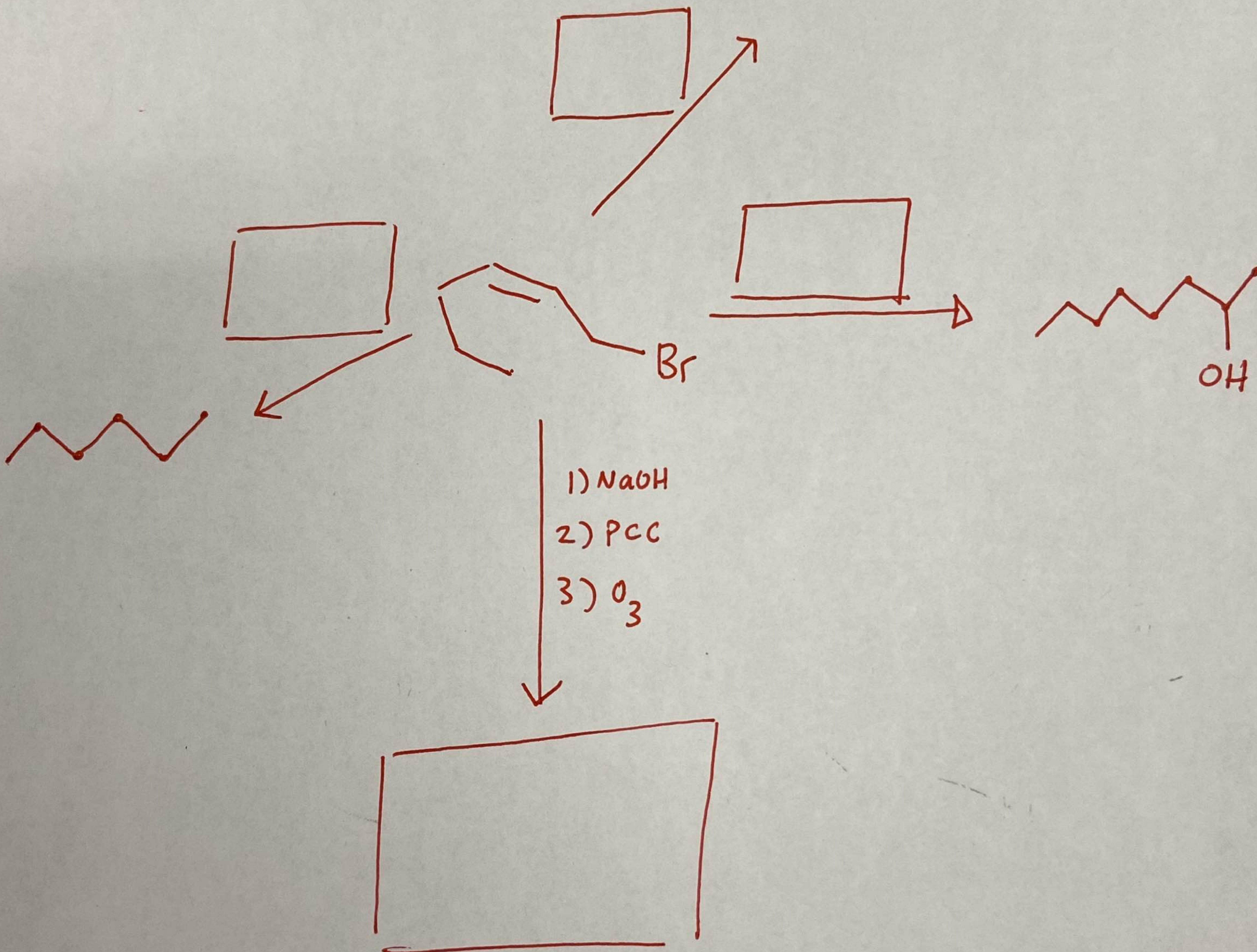


(6) 7) Fill in the boxes with the correct reagents, conditions or organic products. Some of the transformations may require more than one step.



continuation.... Harder.... uses multiple steps.

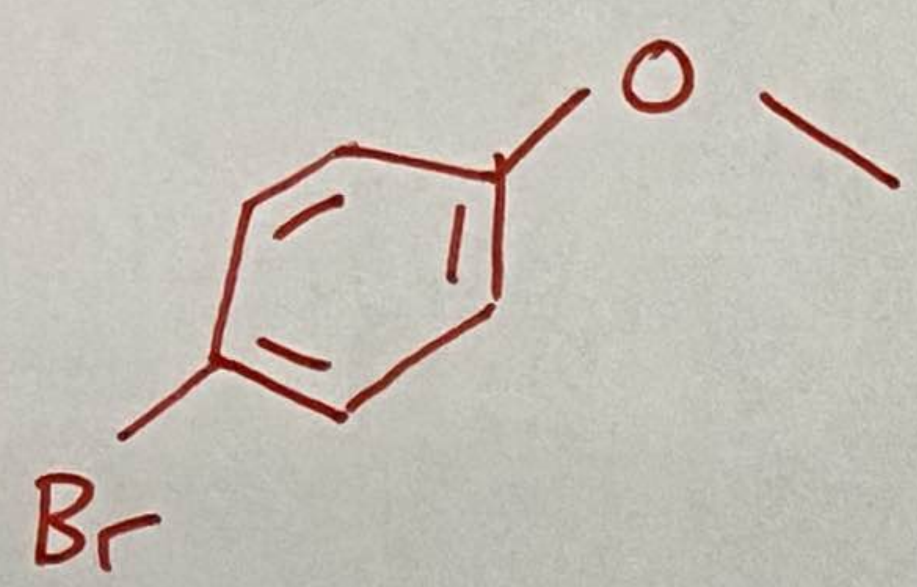


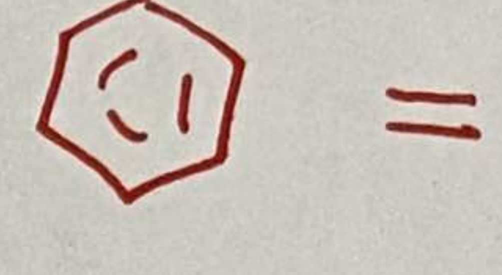


(4) 8) Demonstrate a retrosynthetic approach for each of the target molecules. Using only the starting materials listed. You may invoke any other reagents as needed.

Carbon source(s)

a)





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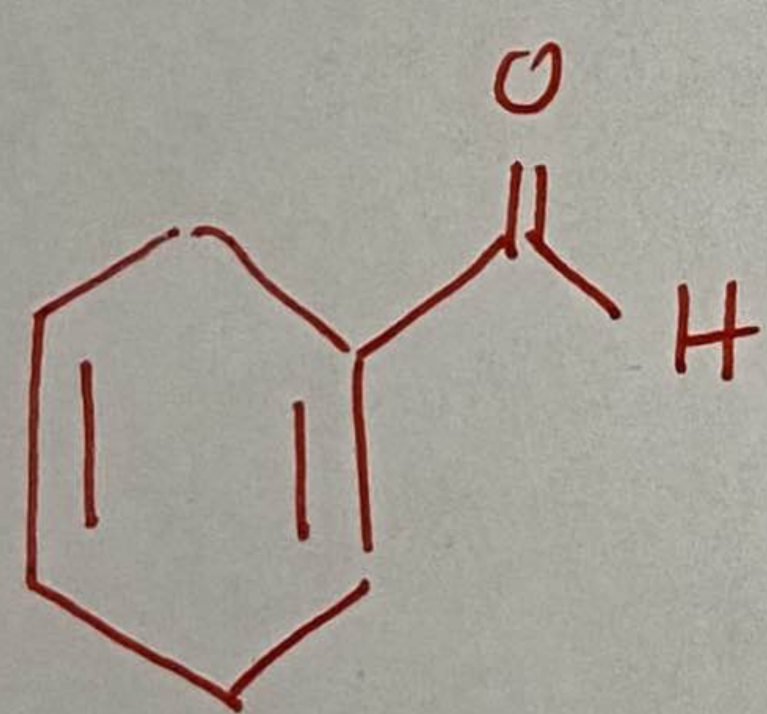

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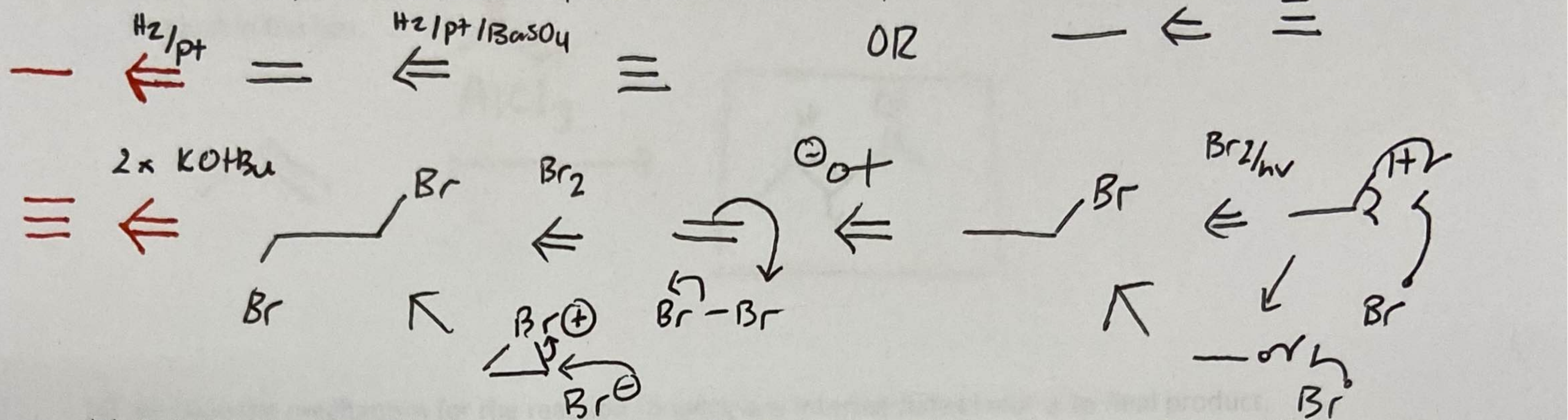
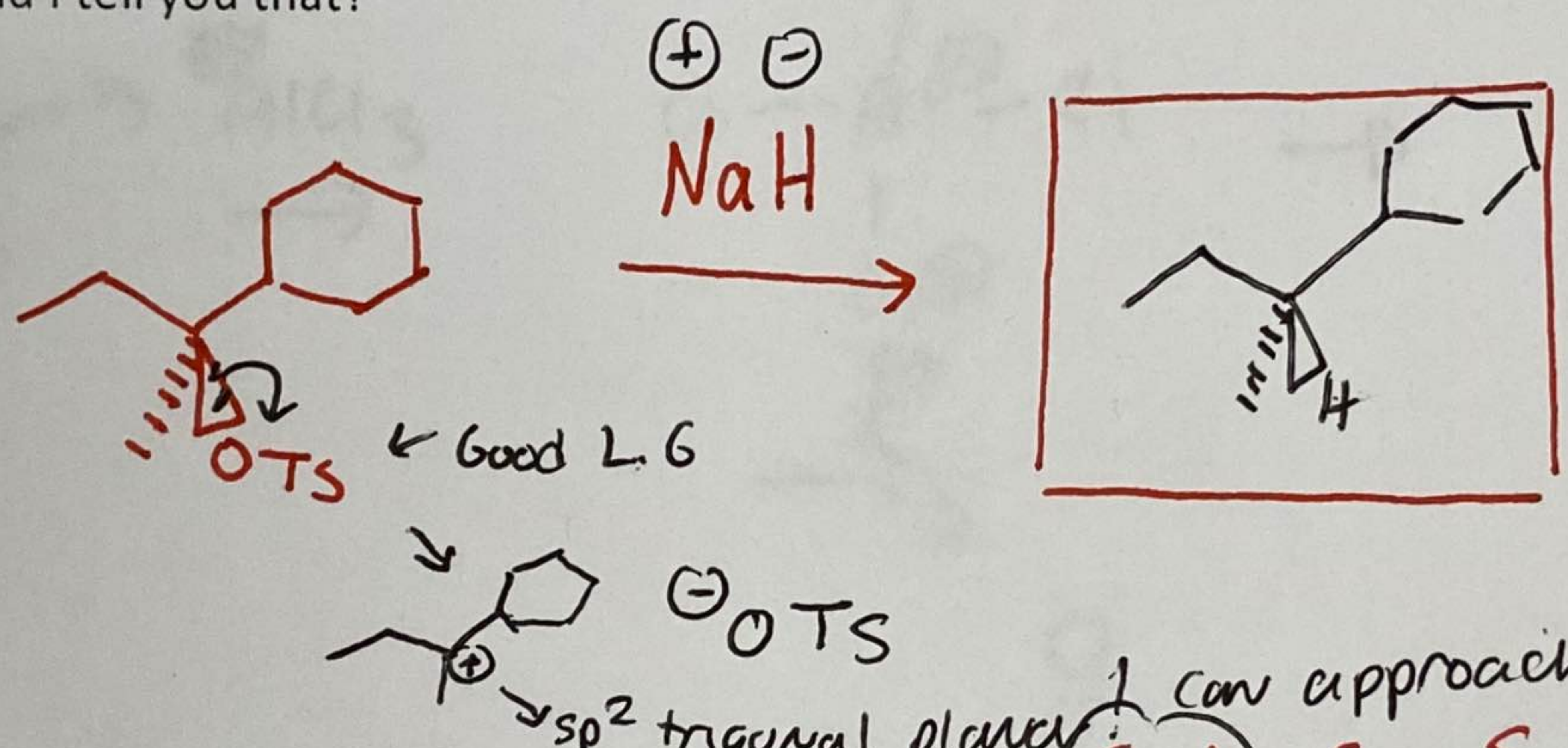


(1) 2 a) Fill in the box with all expected products. The starting material is just one enantiomer. Why did I tell you that?

racemic mixture vs only 1 enantiomer. but for product will be racemic because S_N1 RXN sp^2 intermediate C⊕



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Fully Explain Reasoning

OTs Good LG 3° carbocation R intermediate

3 alkyl groups for e^- donation

→ H bonding!! H – δ⁻ atom :)

(2) c) define and give an example of a polar protic solvent. What would be the expected products in a polar protic solvent.

ethanol, meOH, ammonia, H_2O etc., makes small reagents LARGE through intermolecular forces makes them bulky able to perform

E_1 RXNS / E_2 RXNS

d.b H   d.b H   CH3   CH3   CH   CH

3) A hypothetical reaction with propene (shown below) that yields the following NMR data: ^{13}C BB (ppm): 198, 144, 132, 28, 19.   90° DEPT ^{13}C NMR (ppm): 144, 132.

ald / ketone.

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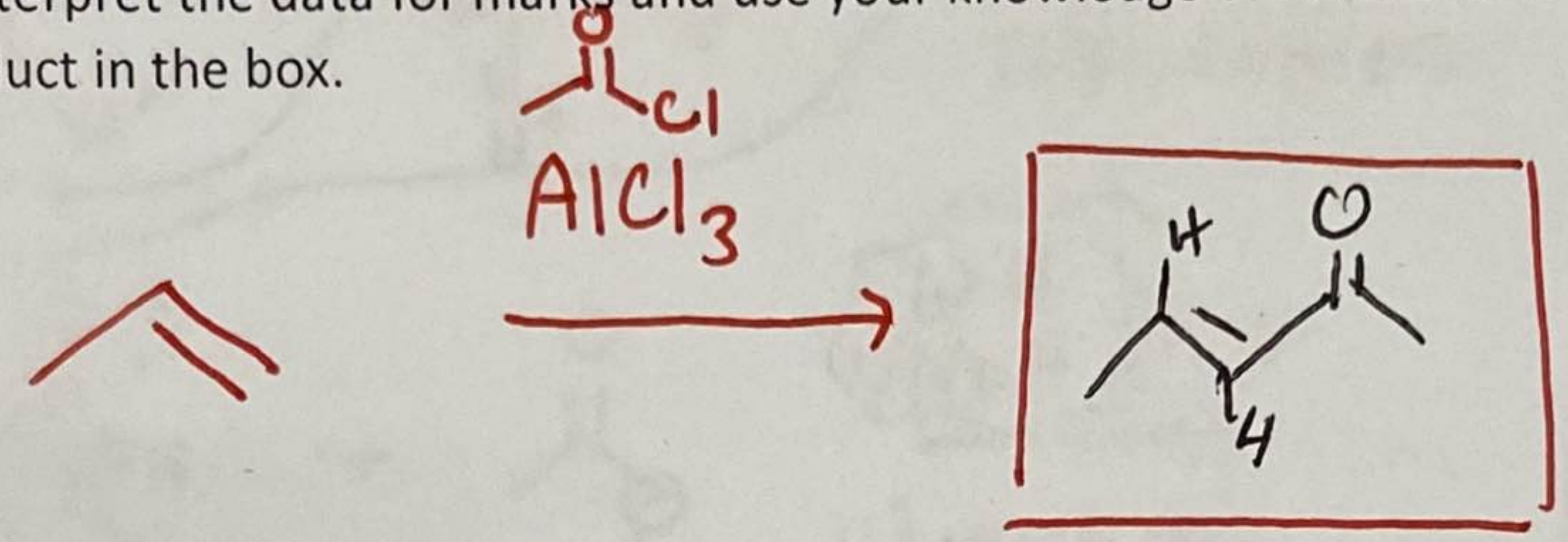

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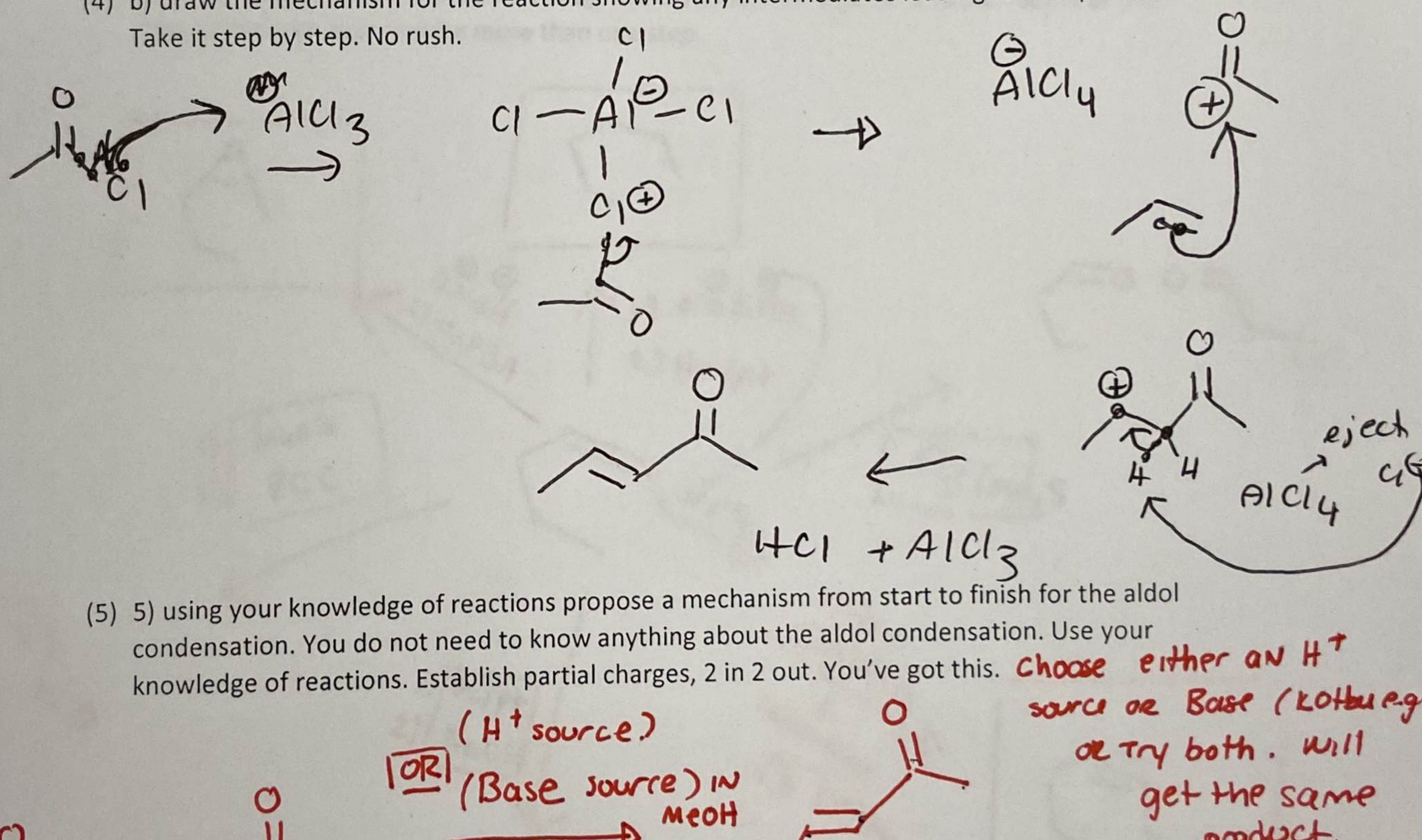

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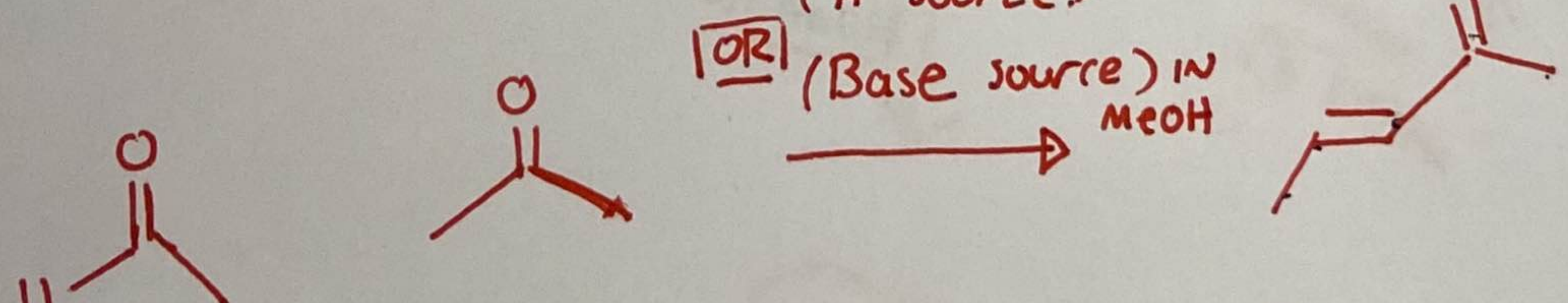
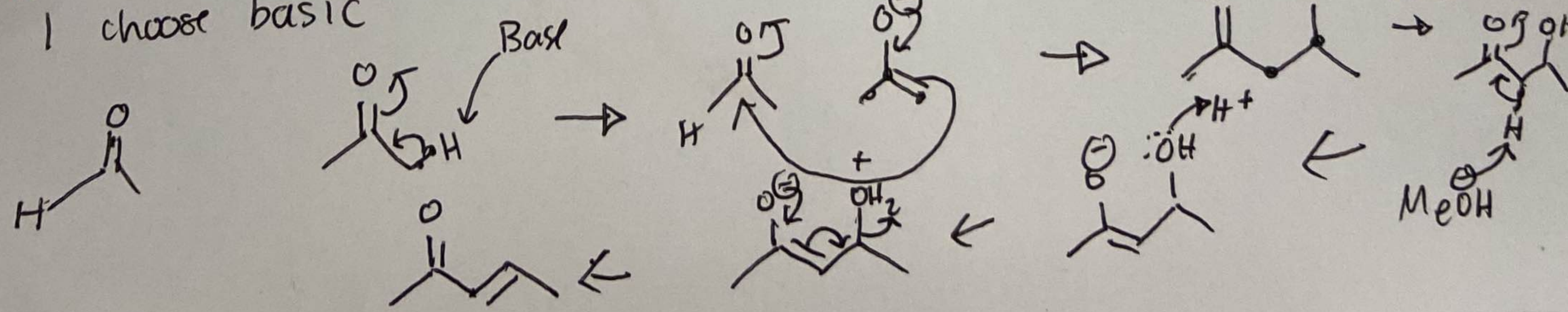


I choose basic



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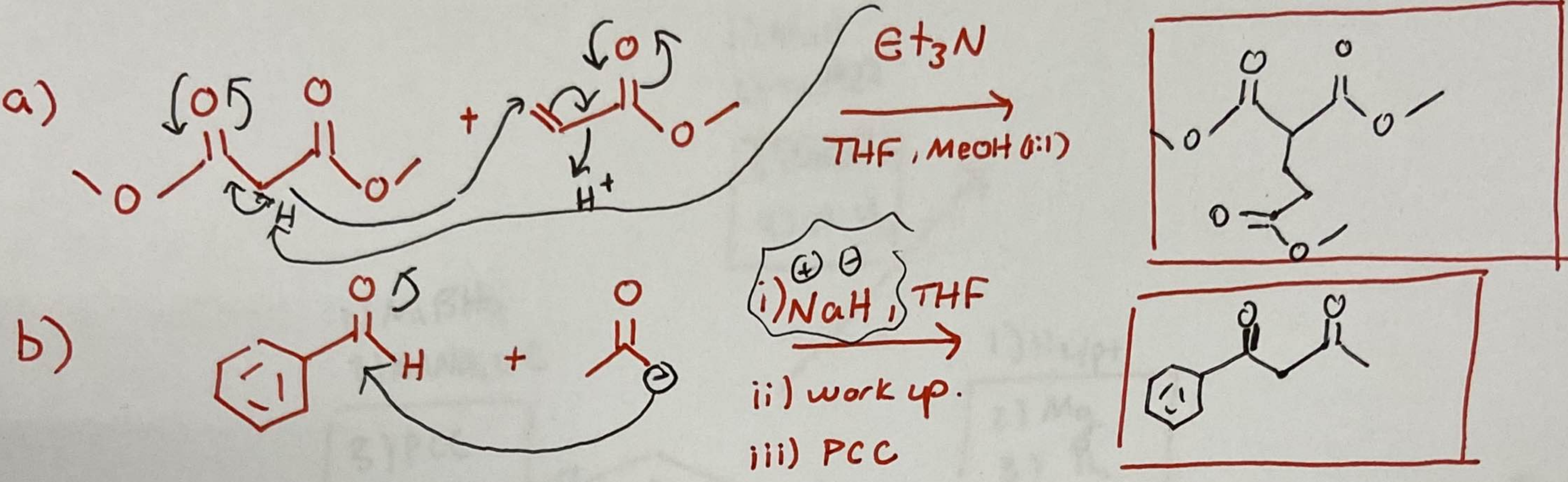

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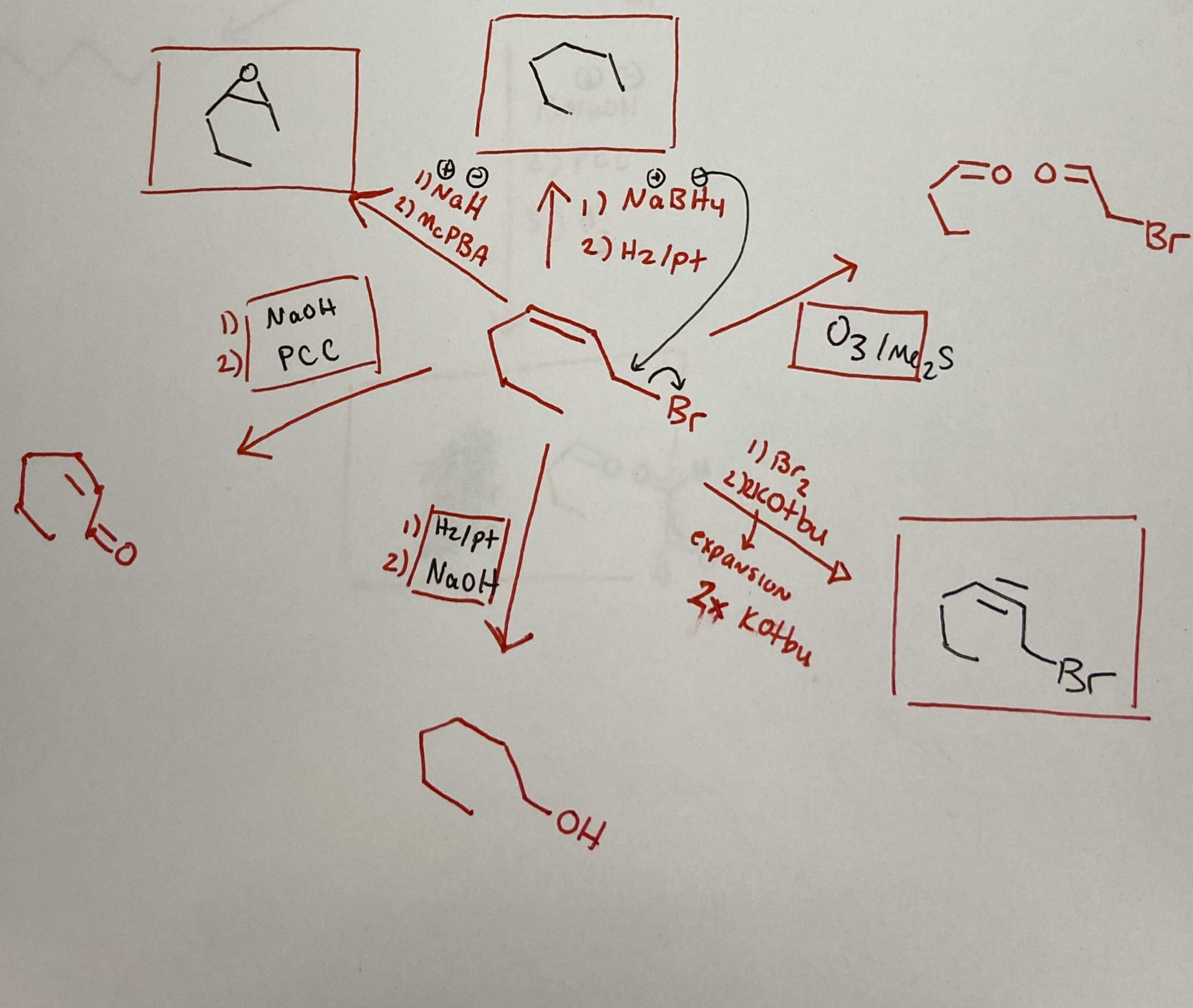

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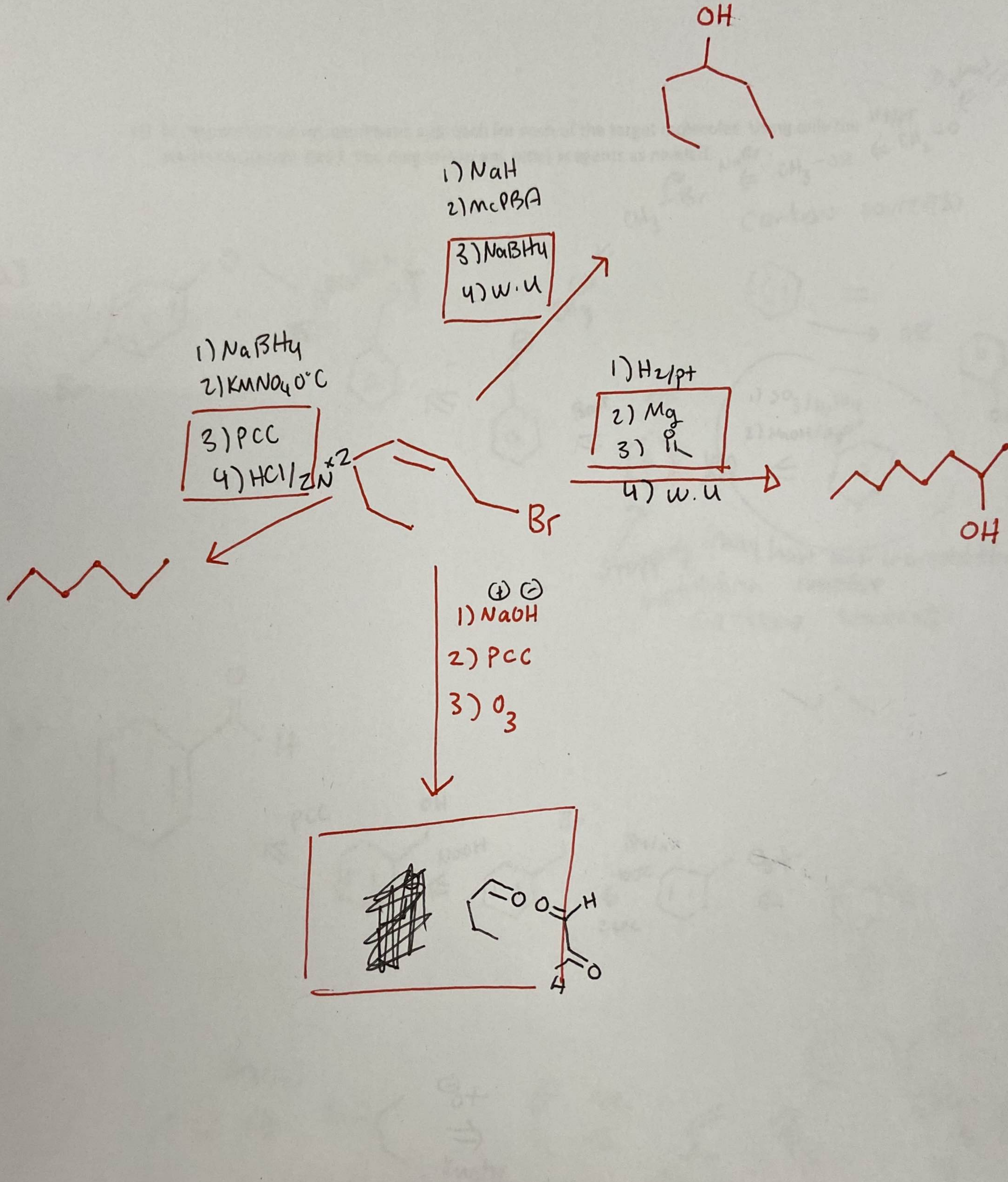

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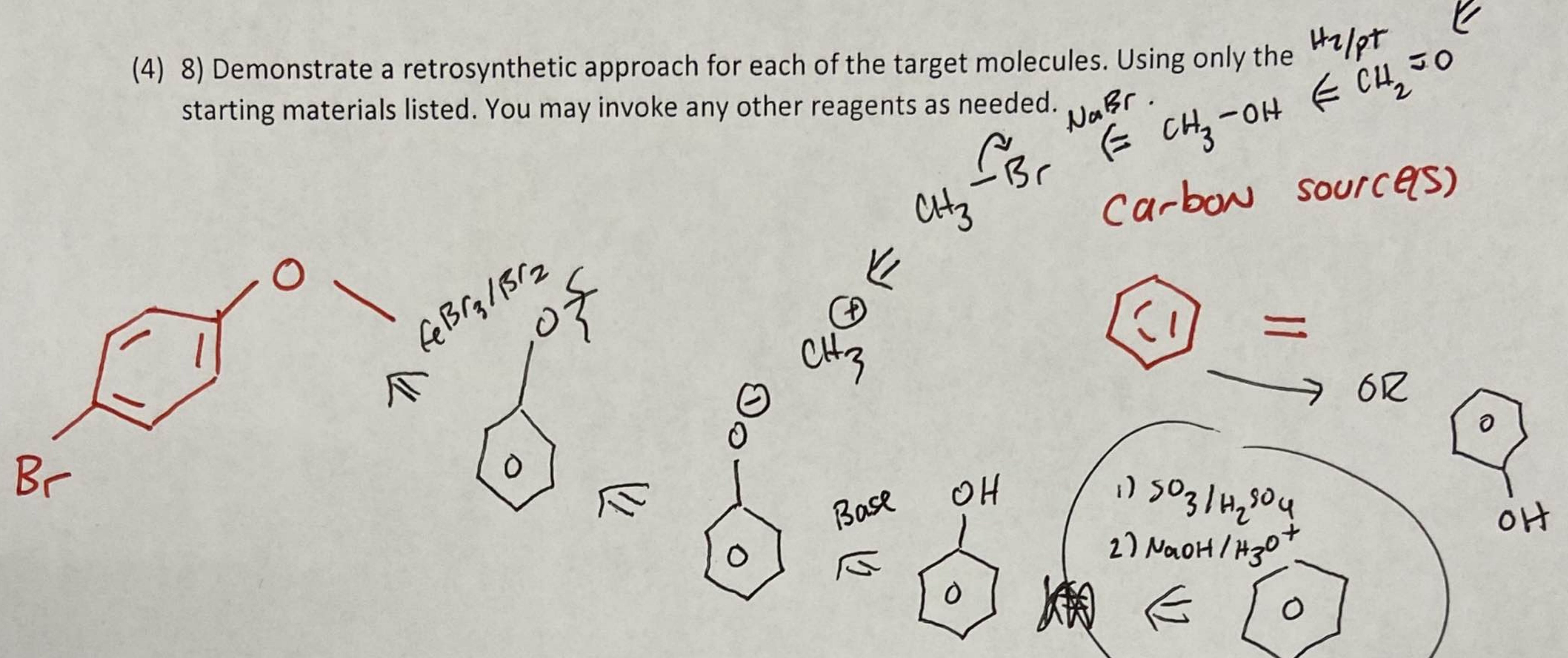

Stopping here is fine

may have not learned this therefore

carbon source(s)

b)