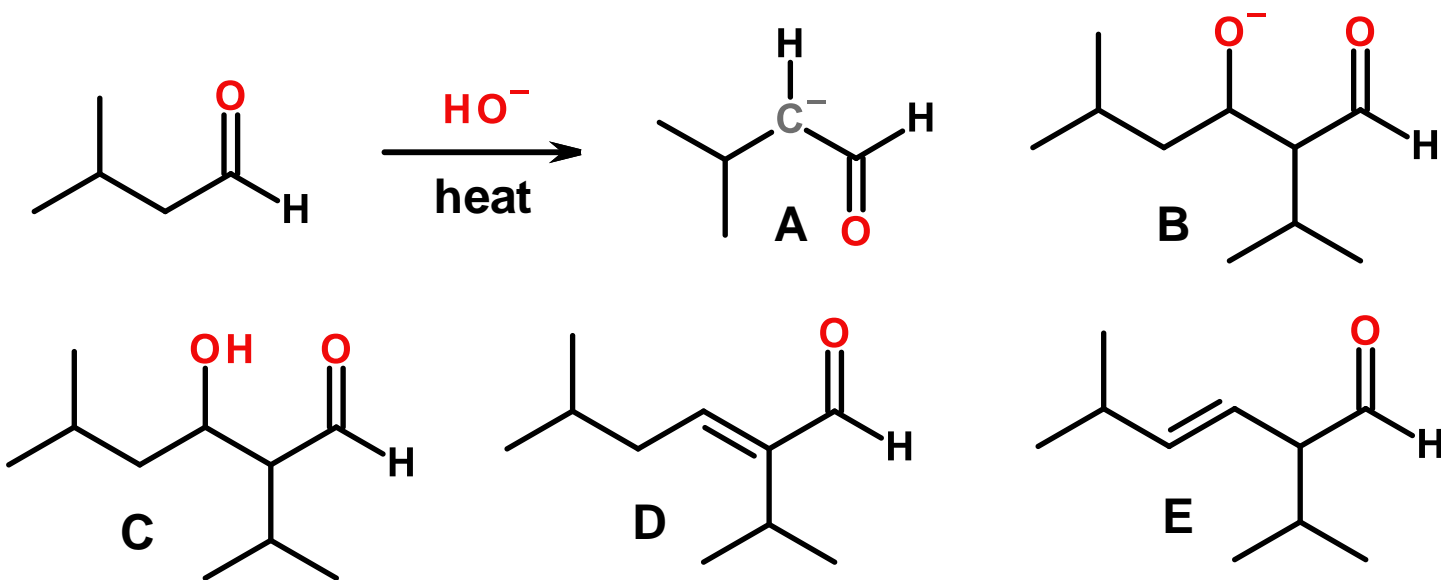
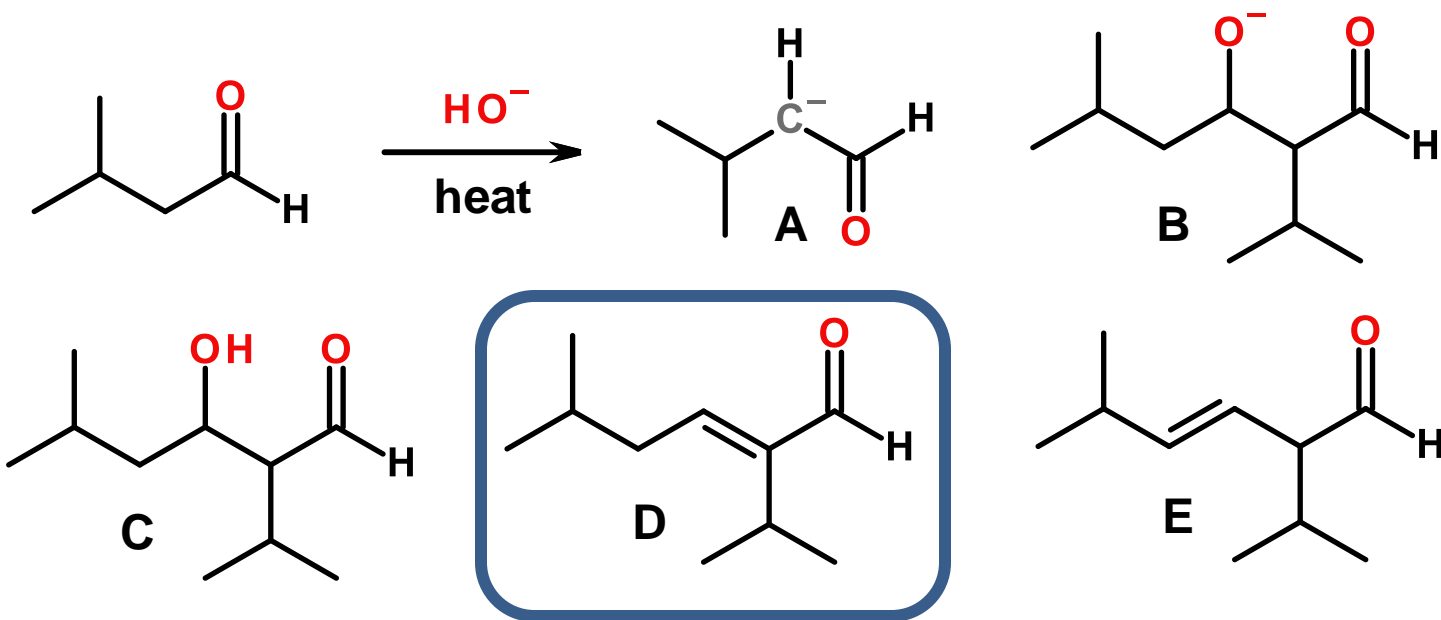


Give the major organic product(s) of the following reaction. Give your answer as a text answer, with the correct answers being listed in alphabetical order. (Example: xxxx a b) **2016-10-28 Q1**



F - None of these products are a major product of the reaction that is shown.

Give the major organic product(s) of the following reaction. Give your answer as a text answer, with the correct answers being listed in alphabetical order. (Example: xxxx a b) **2016-10-28 Q1**



F - None of these products are a major product of the reaction that is shown.

# Exam 3

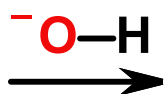
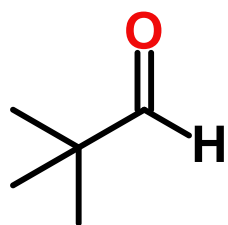
- **Time:**
  - Tuesday, November 8: 7:00 – 9:00PM OR
  - Wednesday, November 9: 7:00 – 9:00PM OR
  - Thursday, November 10: 7:00 – 10:00PM
- **Location – Soc/Anthro Testing Center**
  - Chapters will be covered in this order: Chapter 17, 18
- **Practice Exams are Posted**
  - Ex3A Practice Exam 3A
  - Ex3B Practice Exam 3B
- **Deadline for alternate arrangements is Monday, 11/7/2016 at 4:30 PM (i.e., close of business)**
  - An oral make-up exam will be required for making up the exam for all students not taking the exam on the above dates or having already made prior arrangements

**Exam 3**  
**Lecture**  
**Planning**

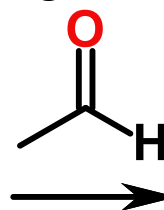
Ex3-01-B7-17-01A Ketone Aldehyde Naming	Friday, October 22
Ex3-01-B7-17-01B Aldehyde Ketone Naming	Saturday, October 22
Ex3-02-B7-17-02A Ald Ket Rxns O-Nucl	Saturday, October 23
Ex3-02-B7-17-02B Ald Ket O-Nucleophiles	Sunday, October 24
Ex3-02-B7-17-02C Ald Ket Rxns O-Nucl	Monday, October 25
Ex3-03-B7-17-03A Ald Ket with N-Nucl	Tuesday, October 26
Ex3-03-B7-17-03B Ald Ket with N-Nucl	Wednesday, October 27
Ex3-03-B7-17-03C Ald Ket with N-Nucl	Thursday, October 28
Ex3-04-B7-17-04A Ald Ket with C-Nucl	Friday, October 29
Ex3-04-B7-17-04B Ald Ket with C-Nucl	Saturday, October 29
Ex3-04-B7-17-04C Ald Ket with C-Nucl	Sunday, October 30
Ex3-05-B7-18-01 Tautomers	Sunday, October 30
Ex3-06-B7-18-02B Alpha-Bromination	Monday, October 31
Ex3-06-B7-18-02C Alpha-Bromination	Tuesday, November 1
Ex3-07-B7-18-03B Alkylation Alpha-C=O	Wednesday, November 2
Ex3-07-B7-18-03C Alkylation Alpha-C=O	Thursday, November 3
Ex3-08-B7-18-04B Malonic Ester Synthesis	Friday, November 4
Ex3-08-B7-18-04C Malonic Ester Synthesis	Saturday, November 5
Ex3-09-B7-18-05 Fatty Acids	Sunday, November 6
<b>Exam 3</b>	<b>November 8, 9, 10</b>

# Mixed Aldol Reaction

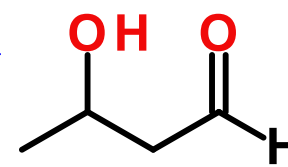
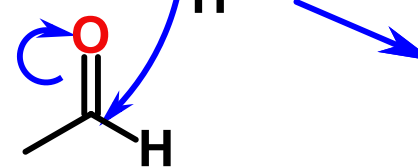
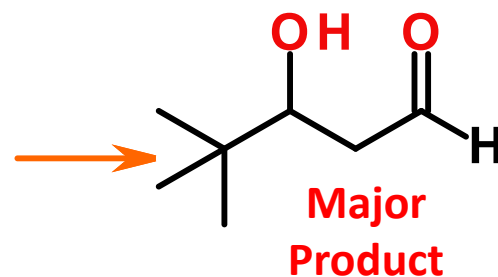
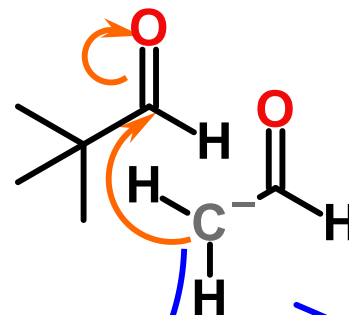
Added dropwise.  
Concentration is less  
than the other reagent.



no reaction  
since there are  
no alpha-H's



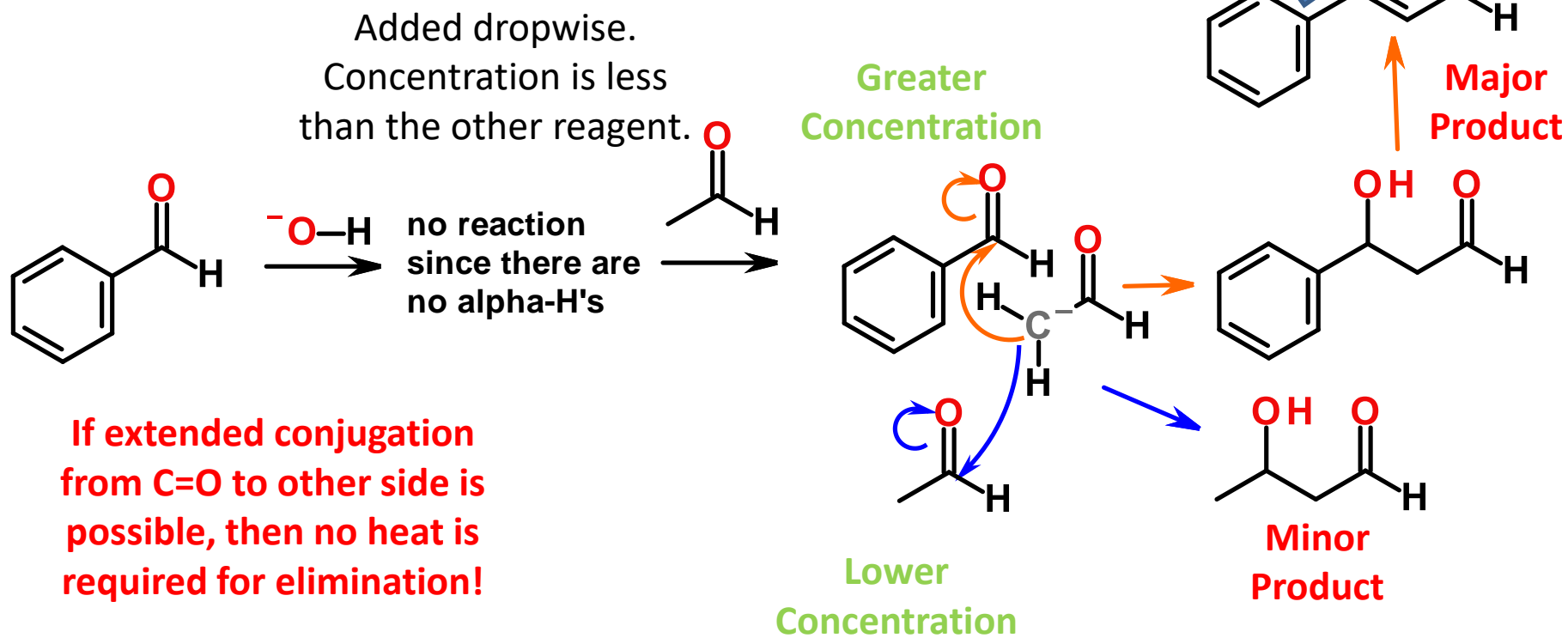
Greater  
Concentration



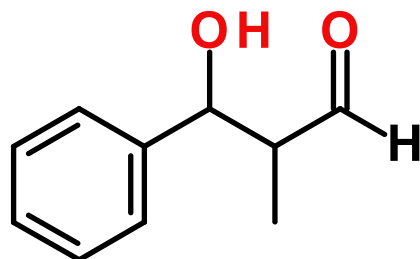
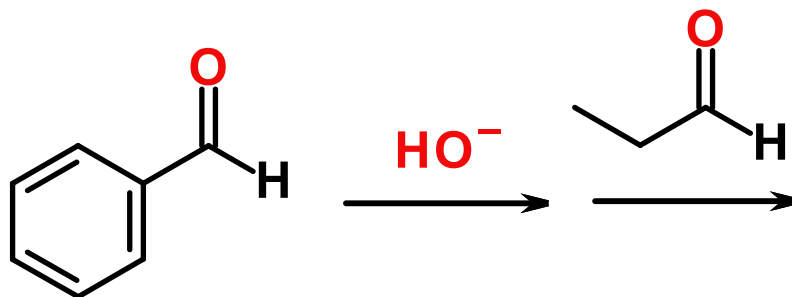
Lower  
Concentration

Minor  
Product

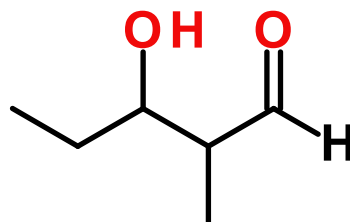
# Mixed Aldol Reaction



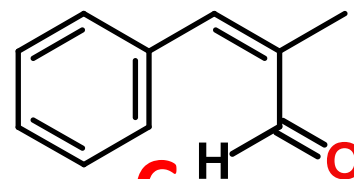
Give the major organic product(s) of the following reaction. Give your answer as a text answer, with the correct answers being listed in alphabetical order. (Example: xxxx a b) **2016-10-28 Q2**



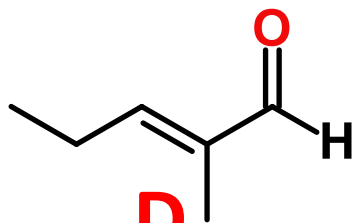
**A**



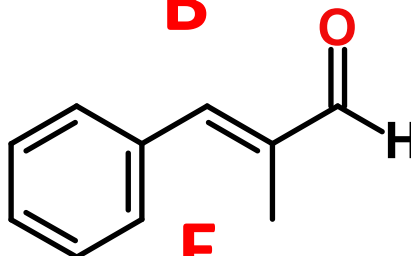
**B**



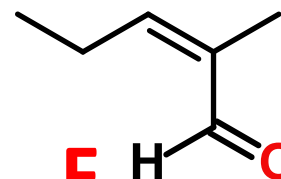
**C**



**D**



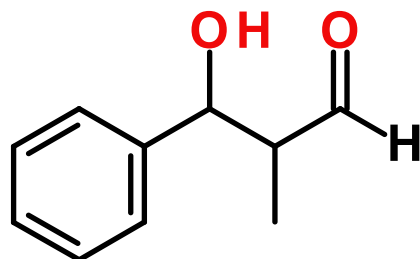
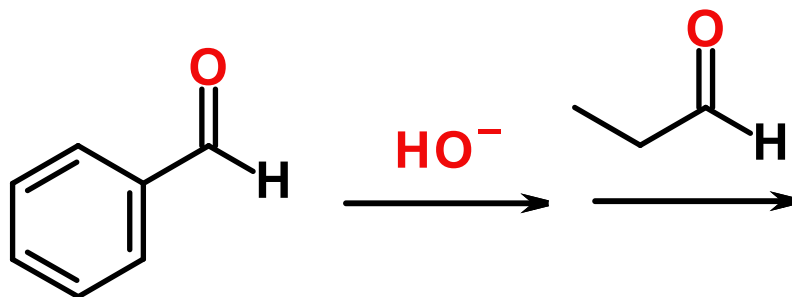
**E**



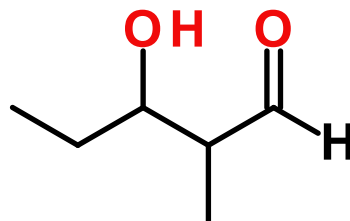
**F**

**G** - None of these products are a major product of the reaction that is shown.

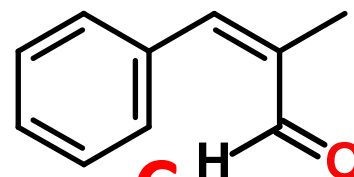
Give the major organic product(s) of the following reaction. Give your answer as a text answer, with the correct answers being listed in alphabetical order. (Example: xxxx a b) **2016-10-28 Q2**



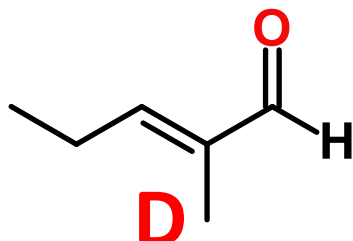
**A**



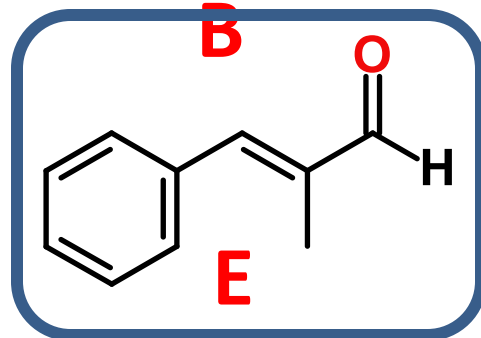
**B**



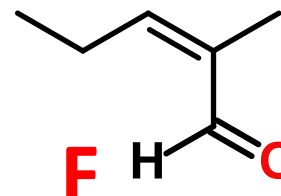
**C**



**D**



**E**

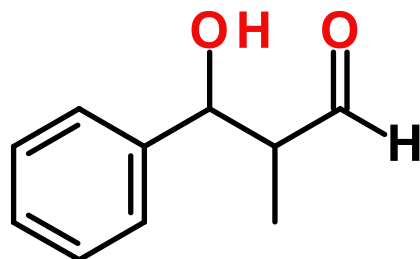
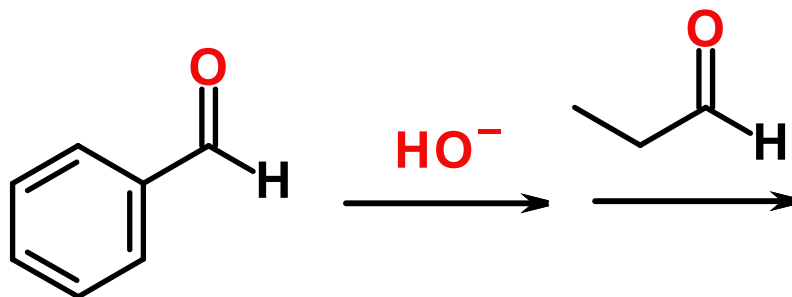


**F**

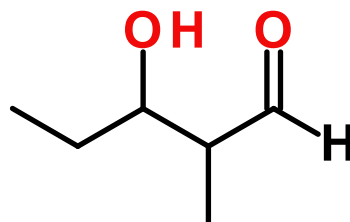
**G** - None of these products are a major product of the reaction that is shown.



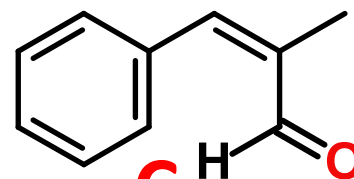
Give the minor organic product(s) of the following reaction. Give your answer as a text answer, with the correct answers being listed in alphabetical order. (Example: xxxx a b) **2016-10-28 Q3**



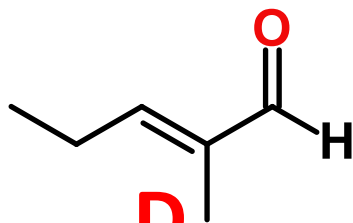
**A**



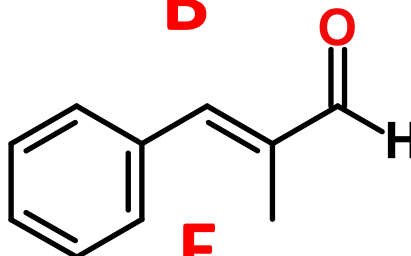
**B**



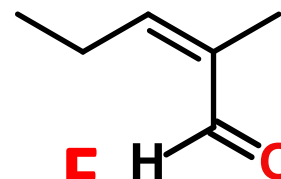
**C**



**D**



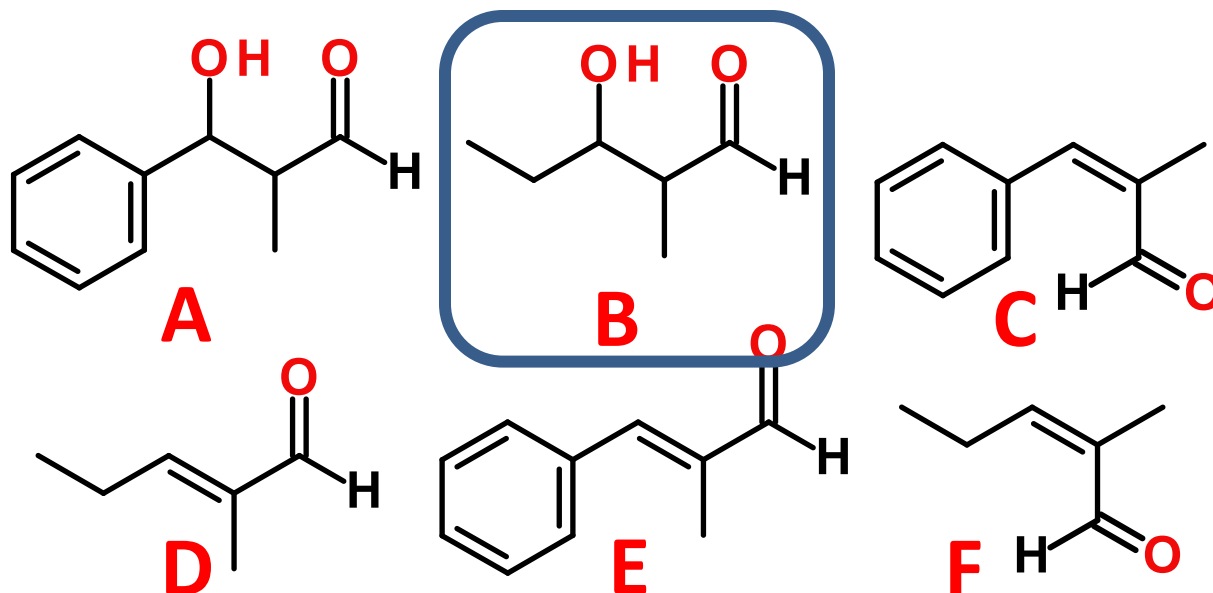
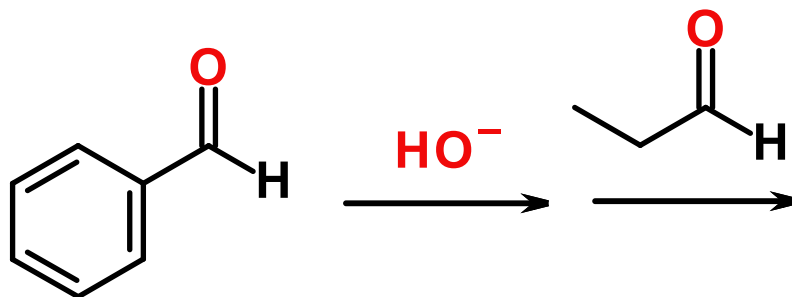
**E**



**F**

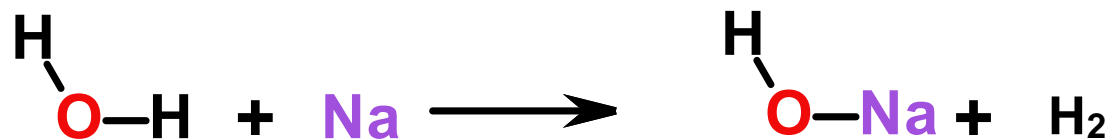
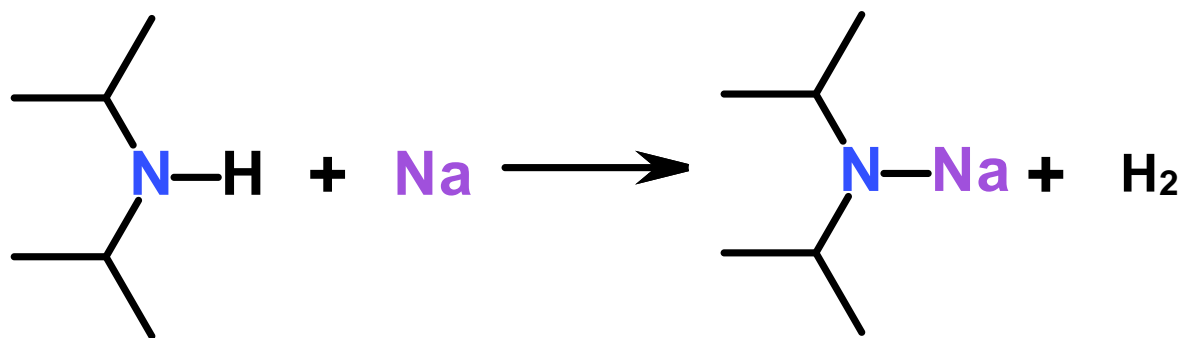
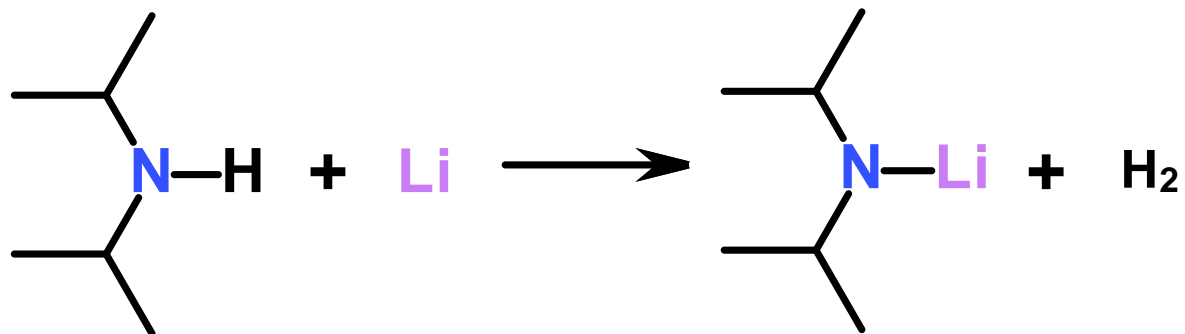
**G** - None of these products are a major product of the reaction that is shown.

Give the minor organic product(s) of the following reaction. Give your answer as a text answer, with the correct answers being listed in alphabetical order. (Example: xxxx a b) **2016-10-28 Q3**

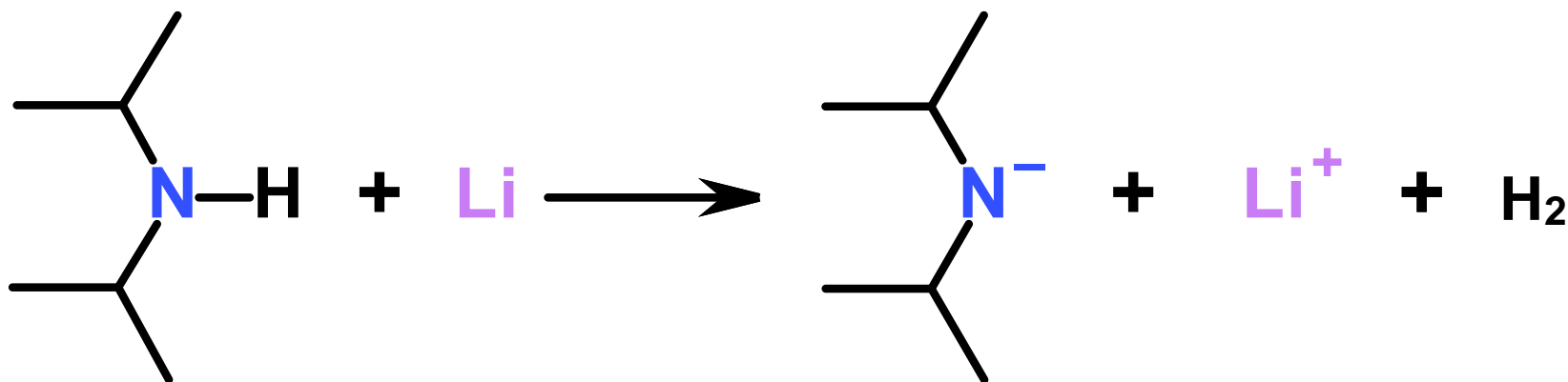


**G** - None of these products are a major product of the reaction that is shown.

# Generating LDA

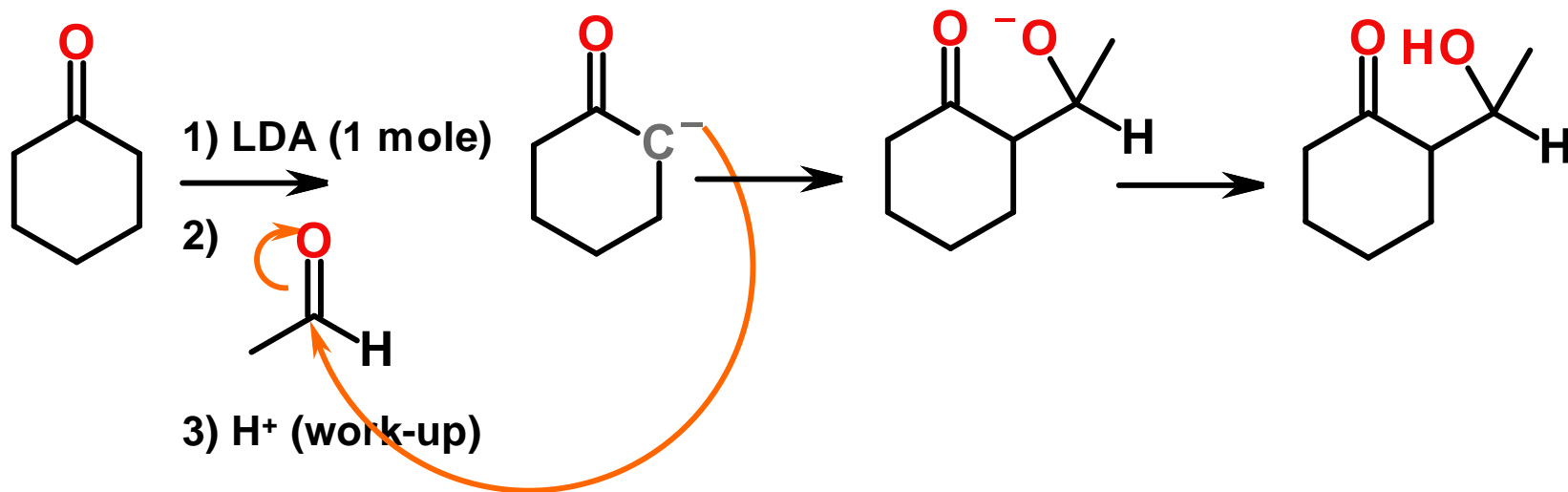


# Lithium Di-isopropylamide (LDA)



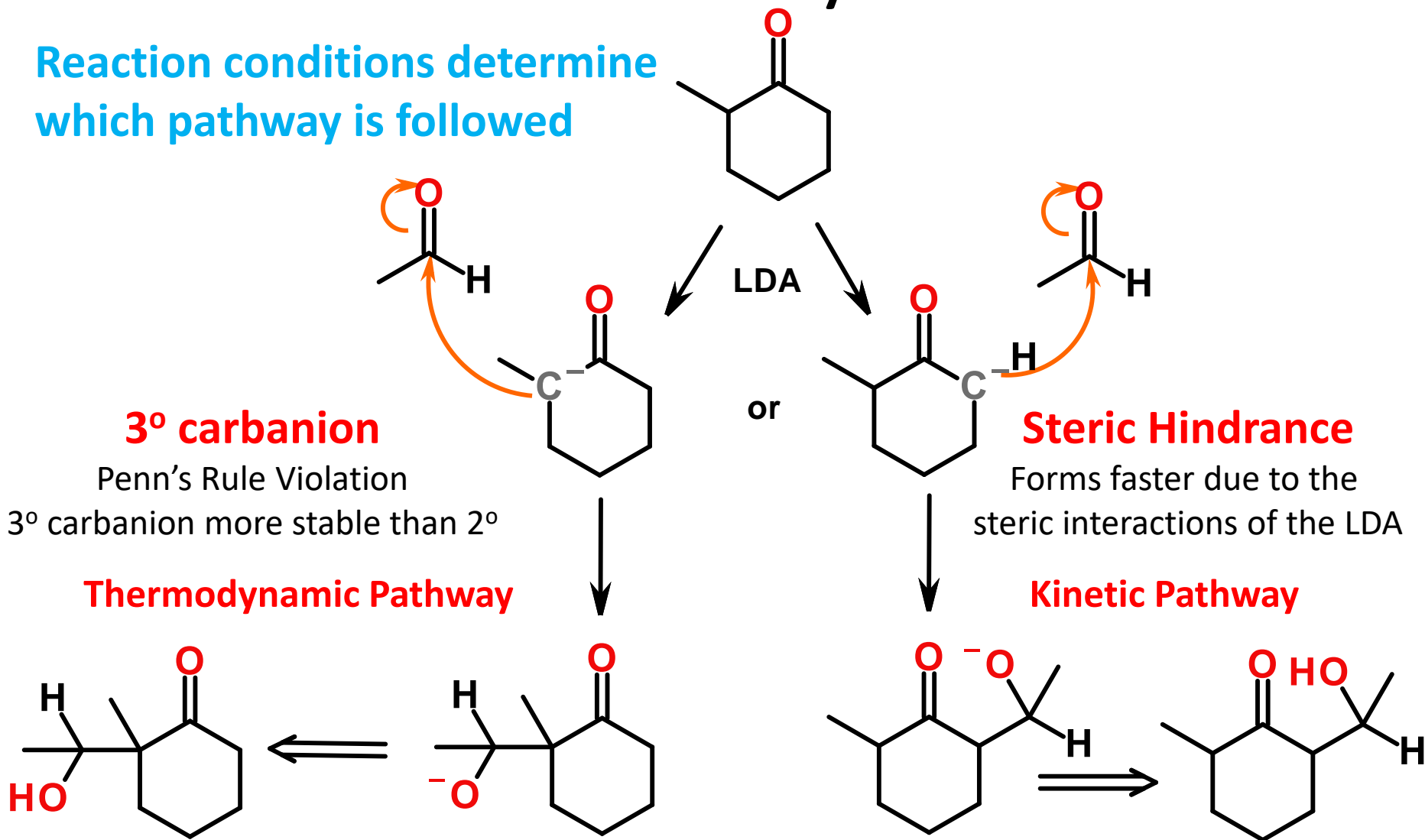
- A. Strong base (N<sup>-</sup> is not that happy, since N is not that electronegative and doesn't want a negative charge)
- B. Non-nucleophilic, b/c of steric hindrance of isopropyl groups

# LDA as a base for H's $\alpha$ to a carbonyl

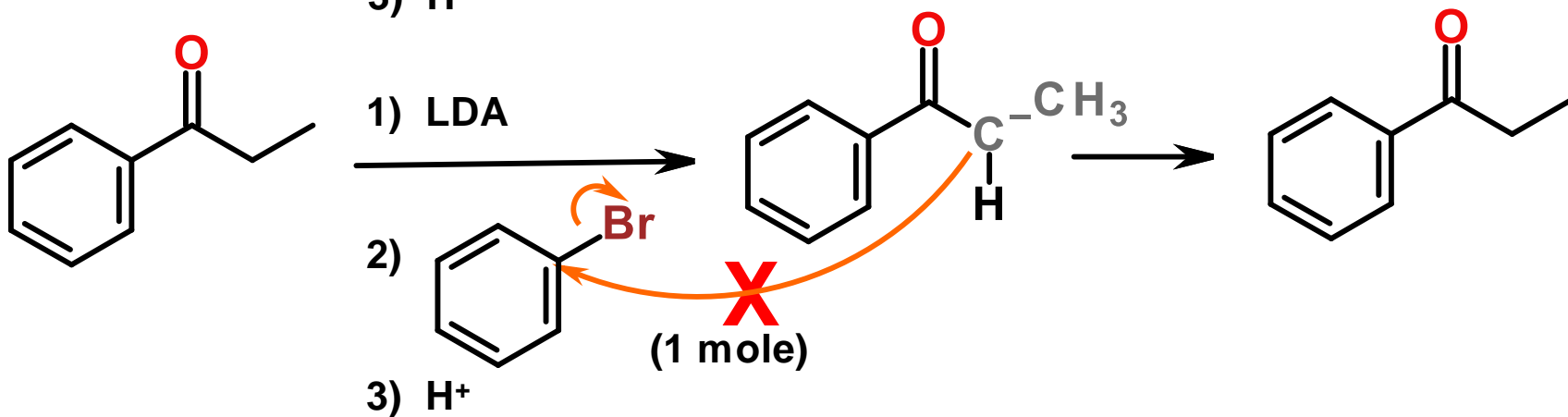
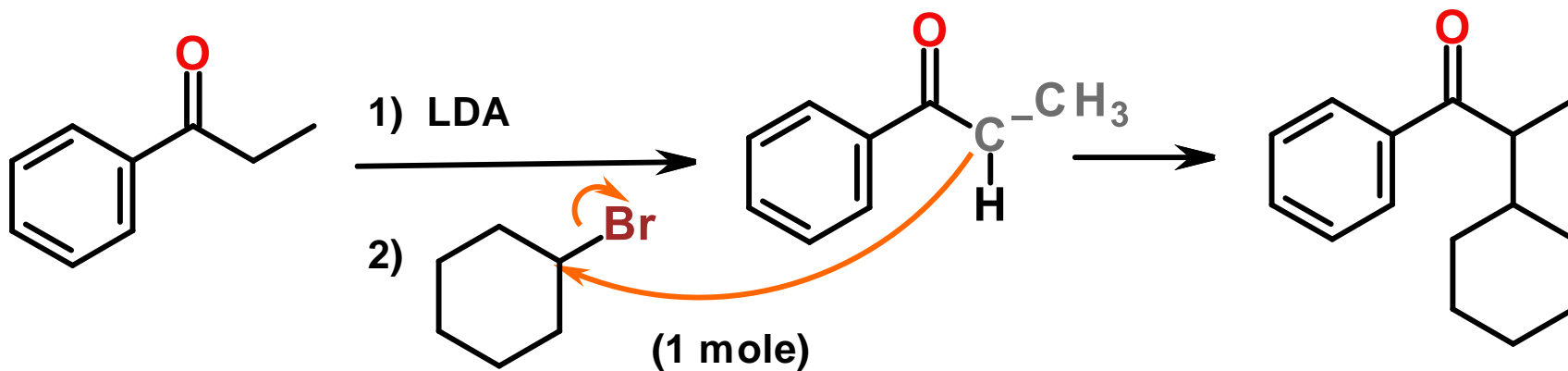


# Kinetic vs Thermodynamic Issues

Reaction conditions determine which pathway is followed



# Examples



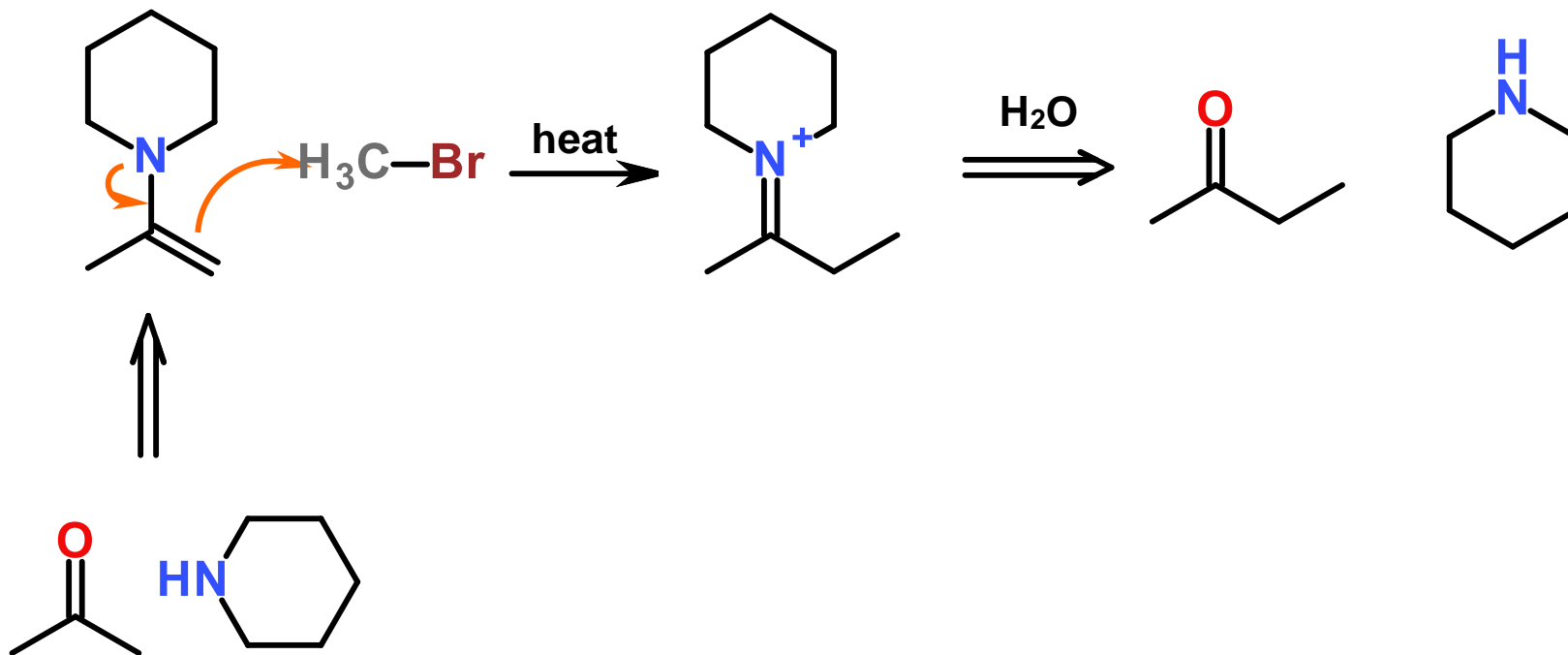
**Remember: S<sub>N</sub>2 substitution order**

Benzylic, allylic > 1° > 2°.

3°, aryl, vinyl do not react

# Use Enamines To Get Only A Single Substitution Reaction

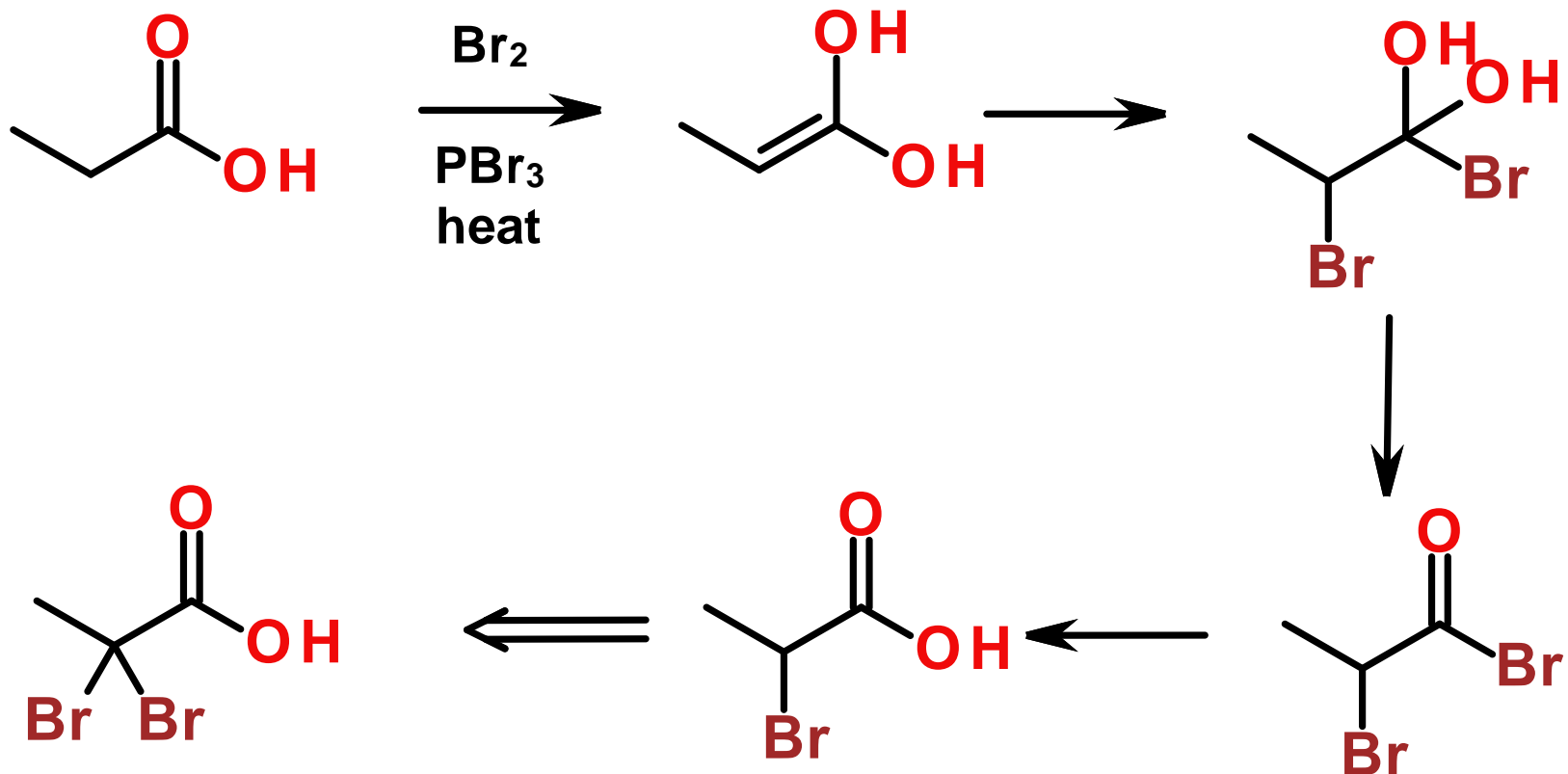
**Enamine** is derived from a 2° amine and a ketone or aldehyde



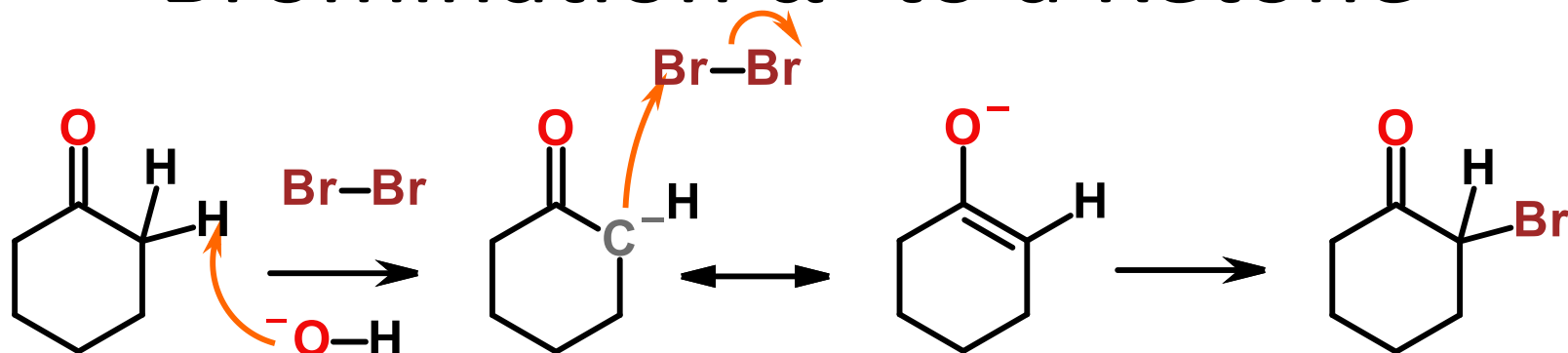


# Hell, Vollhardt, Zeliensky Reaction

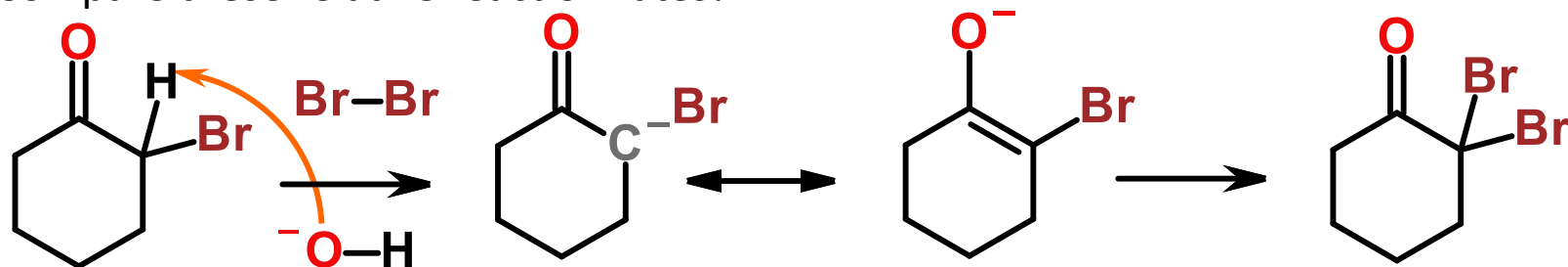
Reaction of Exchangeable Hydrogens  $\alpha$ - to a Carboxylic Acid with  $\text{Br}_2$



# Bromination $\alpha$ - to a Ketone



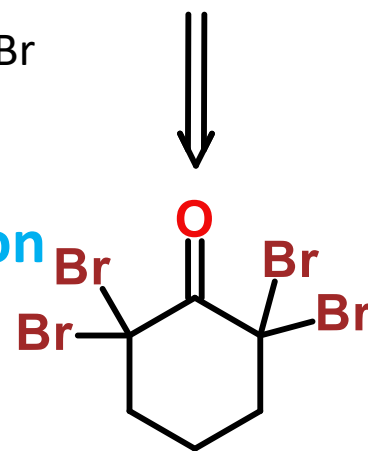
Compare these relative reaction rates!



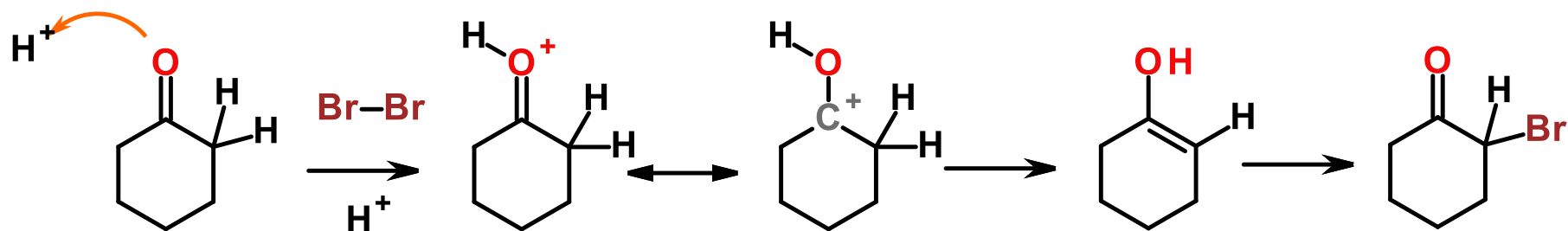
More stable due to electronegativity of Br

**Faster Reaction!**

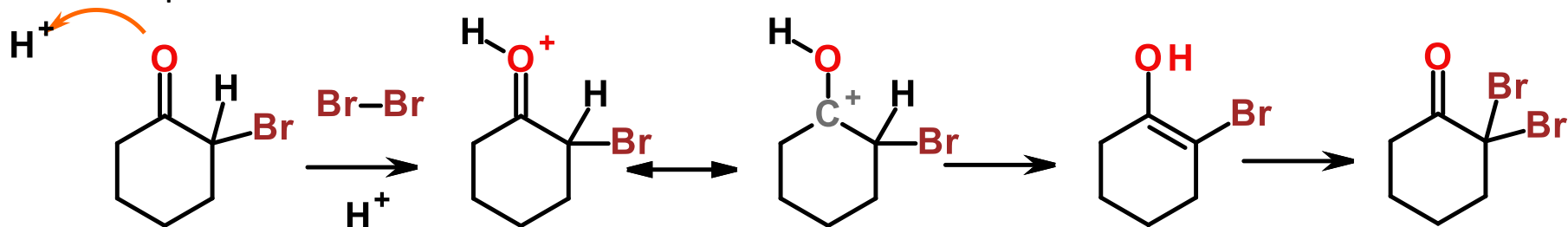
**Impossible to stop with monohalogenation  
with basic conditions**



# Bromination $\alpha$ - to a Ketone



Compare these relative reaction rates!

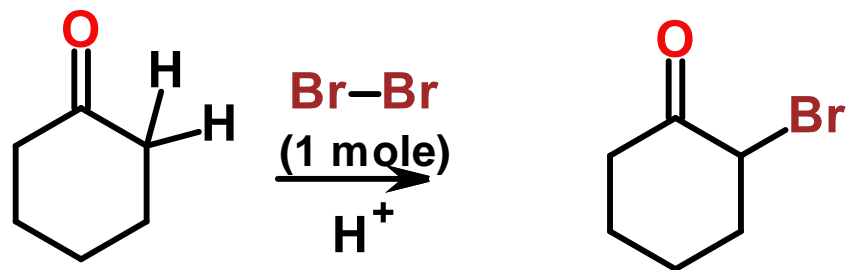
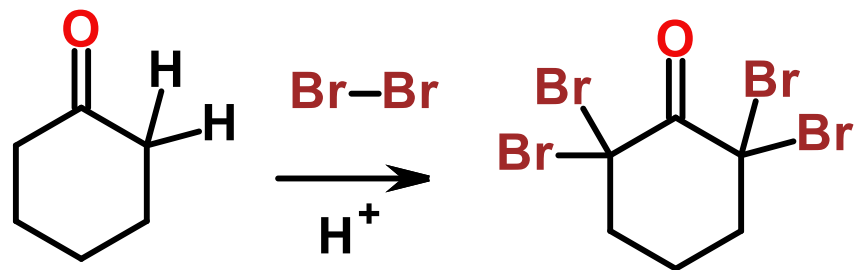
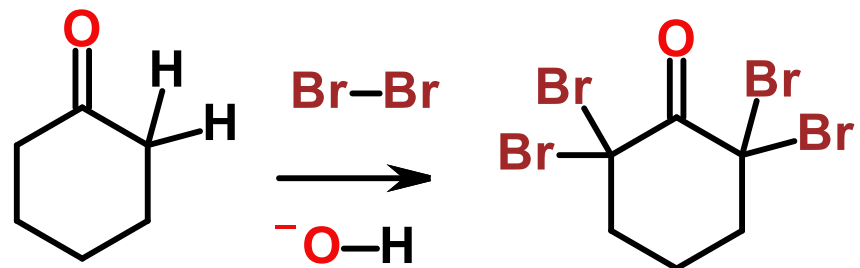


Less stable due to electronegativity of Br

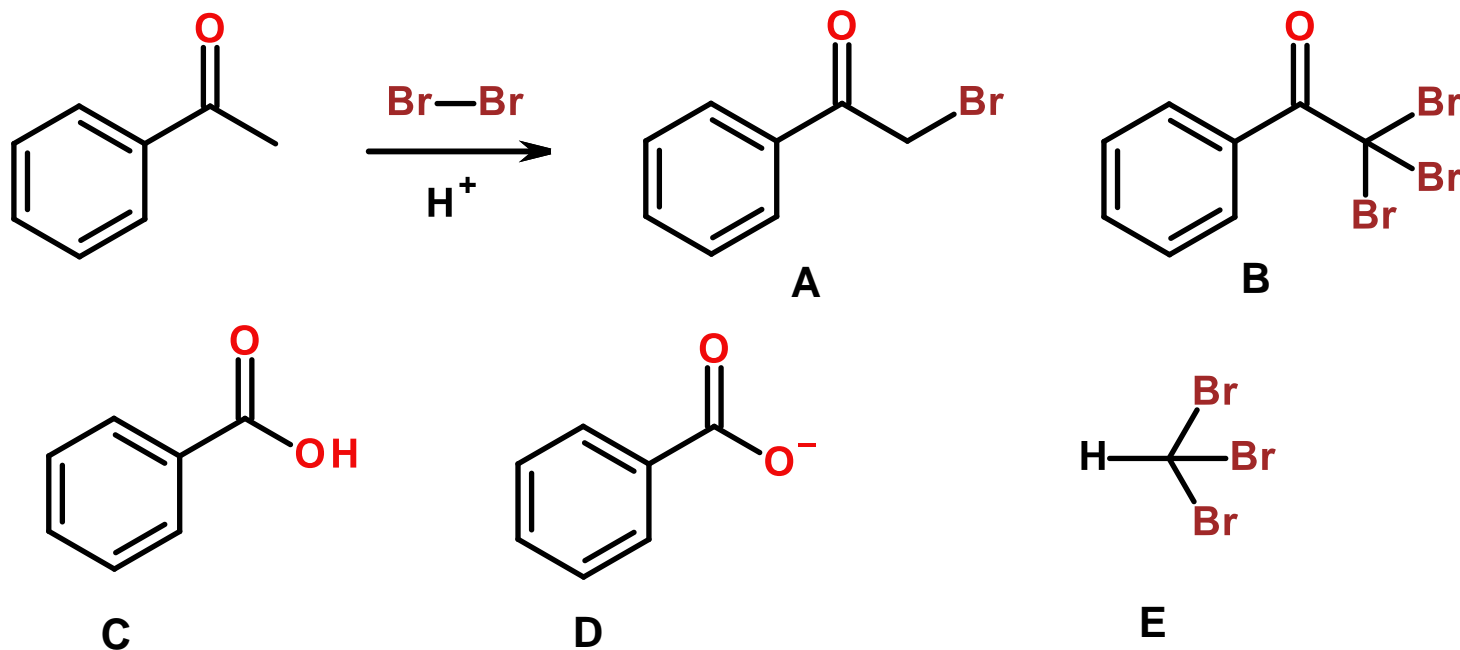
**Slower Reaction!**

**Monohalogenation is possible  
with acidic conditions**

# Examples

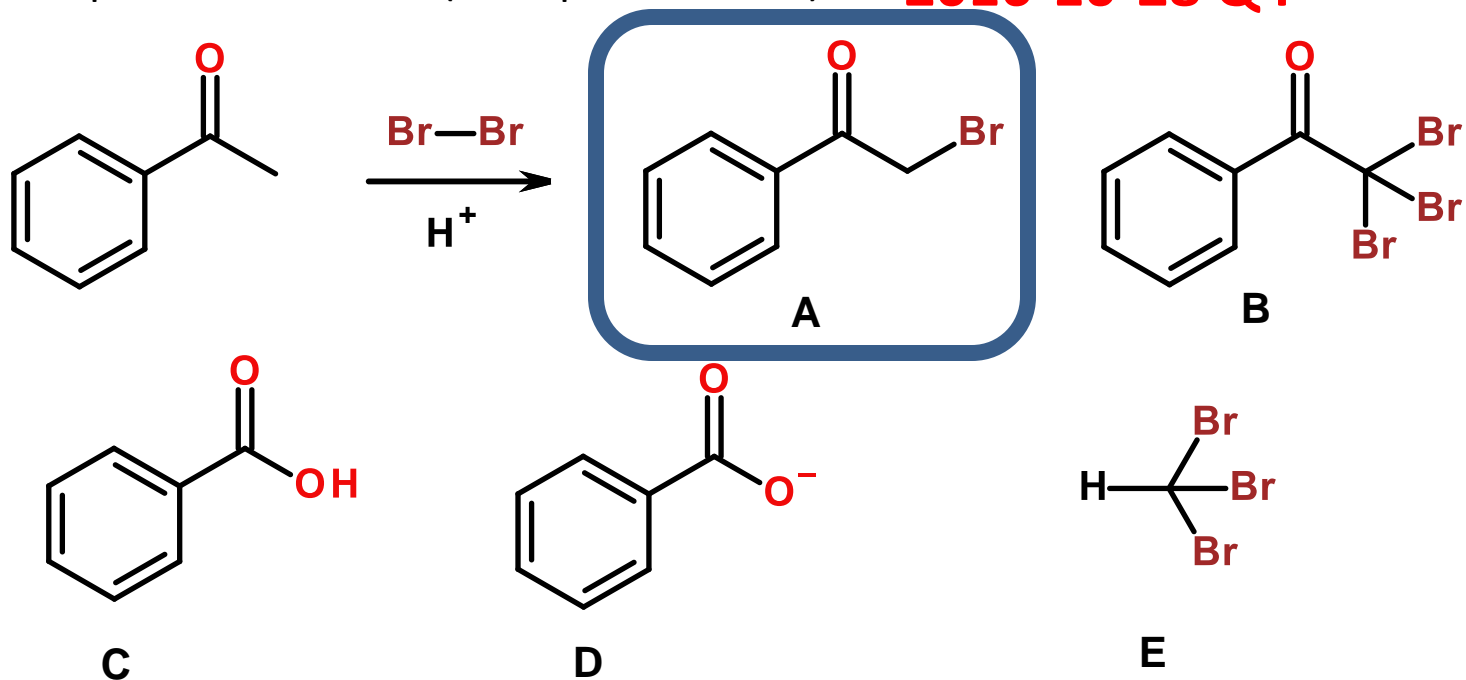


Give the major organic product(s) of the following reaction. Give your answer as a text answer, with the correct answers being listed in alphabetical order. (Example: xxxx a b) **2016-10-28 Q4**



F - None of these products are a major product of the reaction that is shown.

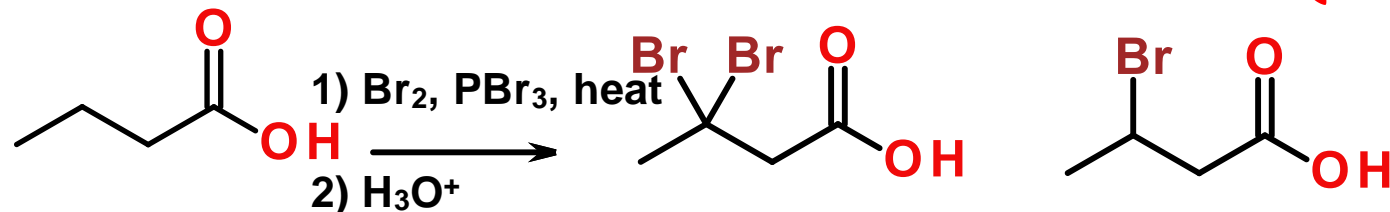
Give the major organic product(s) of the following reaction. Give your answer as a text answer, with the correct answers being listed in alphabetical order. (Example: xxxx a b) **2016-10-28 Q4**



F - None of these products are a major product of the reaction that is shown.

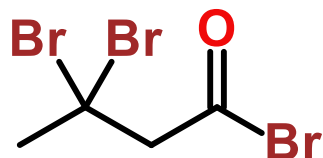
Give the major organic product(s) of the following reaction. Give your answer as a text answer, with the correct answers being listed in alphabetical order. (Example: xxxx a b)

2016-10-28 Q5

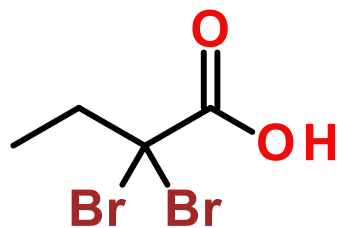


A

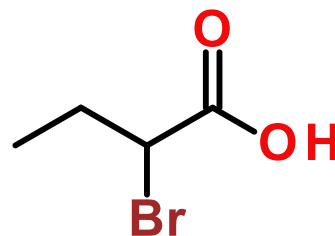
B



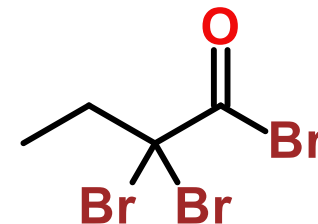
C



D



E

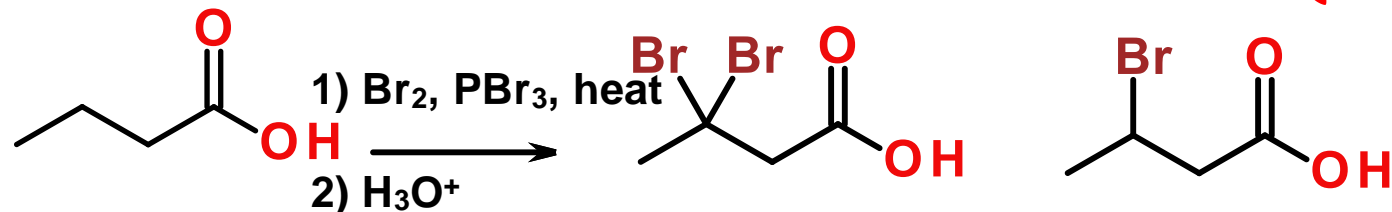


F

G - None of these products are a major product of the reaction that is shown.

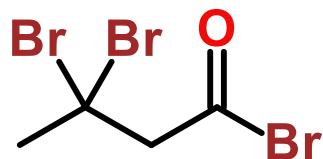
Give the major organic product(s) of the following reaction. Give your answer as a text answer, with the correct answers being listed in alphabetical order. (Example: xxxx a b)

2016-10-28 Q5

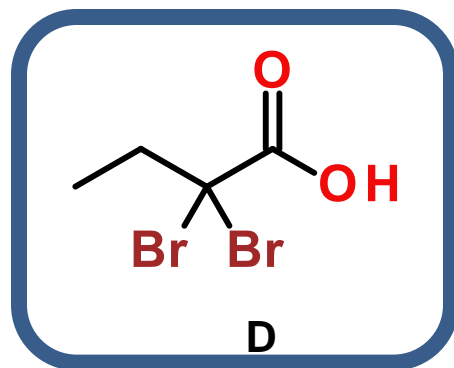


A

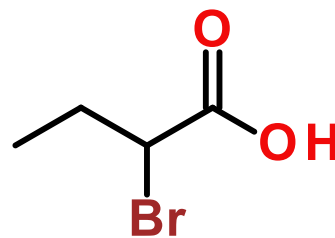
B



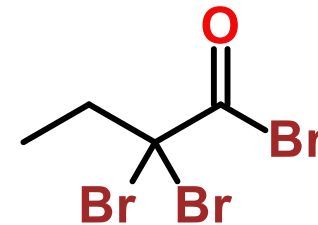
C



D



E



F

G - None of these products are a major product of the reaction that is shown.