

LeAP: Alcohols, Ethers, and the S_NAc Mechanism

- Due Oct 17, 2024 at 11:59pm
- Points 5
- Questions 11
- Available Oct 6, 2024 at 12am - Oct 21, 2024 at 11:59pm
- Time Limit None
- Allowed Attempts 2

Instructions

Lecture Application Practices (LeAPs) serve as initial opportunities for students to apply the information they've gathered from the pre-lecture videos and in-person lectures/lecture videos.

Students are strongly encouraged to complete LeAPs on the same day that the corresponding topic is completed in class. However, to provide consistent due dates, sets of LeAPs will be due on Thursdays at 11:59 PM - Chicago time. See the Weekly Schedules or Course Calendar for specific due dates for each activity.

Each LeAP is worth 5 points. Credit will be awarded based on accuracy. There is no time limit. Students will receive two attempts for each assignment and the highest score will be recorded in the gradebook. LeAPs may consist of multiple-choice, calculation, ranking, choose all that apply, and fill in the blank type questions.

This quiz was locked Oct 21, 2024 at 11:59pm.

Attempt History

	Attempt	Time	Score
LATEST	<u>Attempt 1</u>	4,154 minutes	5 out of 5

🚫 Correct answers are hidden.

Score for this attempt: 5 out of 5

Submitted Oct 17, 2024 at 11:16am

This attempt took 4,154 minutes.



Question 1

0.5 / 0.5 pts

Rank the following molecules from lowest to highest boiling point: 2-propanol, 2-methylpropane, acetone. (#1 would be the lowest boiling point. #3 is the highest.)

2-methylpropane



2

acetone



3

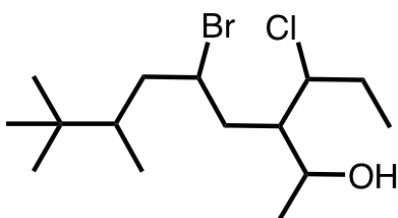
2-propanol



Question 2

0.5 / 0.5 pts

Name the molecule shown below.



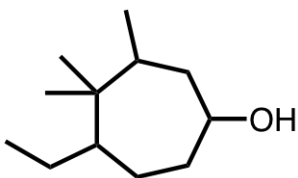
- ☒ 5-bromo-3-(1-chloropropyl)-7,8,8-trimethyl-2-nonanol
- ☐ 5-bromo-8-chloro-7-(1-ethanol)-2,2,3-trimethyl-2-decanol
- ☐ 5-bromo-7-(1-chloropropyl)-2,2,3-trimethyl-8-nonanol
- ☐ 6-bromo-3-chloro-4-(1-ethanol)-8,9,9-trimethyl-2-decanol



Question 3

0.5 / 0.5 pts

Write the name of the molecule shown below in the blank.



5-ethyl-3,4,4-trimethylcycloheptanol



Question 4

1 / 1 pts

Consider each alkyl halide starting material given below. Then, determine which reagent(s) should be applied to transform the alkyl halide into an alcohol most efficiently.

Starting Material	Reagent(s)	Alcohol Product
1-chloropropane	NaOH	1-propanol
2-chloro-2-methylpropane	[Select]	2-methyl-2-propanol
chloromethane	[Select]	methanol
1-chloro-2-methylpropane	1. NaOAc; 2. NaOH	2-methyl-1-propanol

Answer 1:

NaOH

1. NaOAc; 2. NaOH

H₂O

Answer 2:

H₂O

1. NaOAc; 2. NaOH

NaOH

Answer 3:

NaOH

1. NaOAc; 2. NaOH

H₂O

Answer 4:

1. NaOAc; 2. NaOH

NaOH

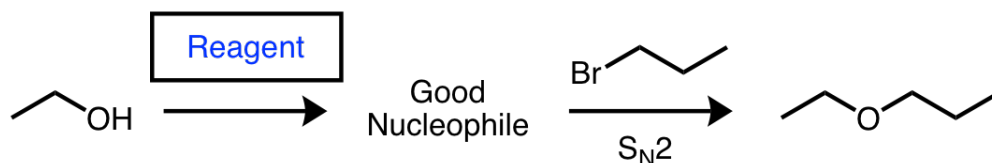
H₂O



Question 5

0.25 / 0.25 pts

Which reagent can be used to convert ethanol (a poor nucleophile) into an alkoxide (a good nucleophile), which can then be used in an S_N2 reaction to make a new O-C bond?



☒ NaH

☐ H₂O

☐ NaCl

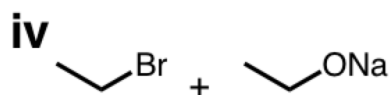
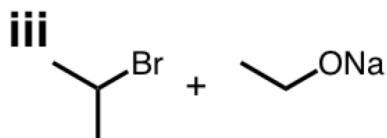
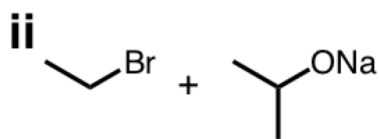
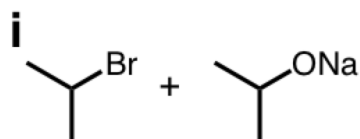
☐ HOC(CH₃)₃



Question 6

0.5 / 0.5 pts

What sets of reagents will result in an efficient Williamson ether synthesis (S_N2)?



☒ ii and iv

☐ iii and iv

☐ iv

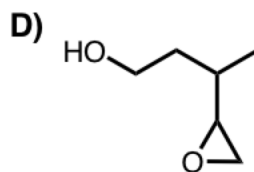
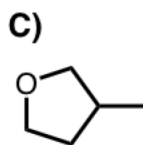
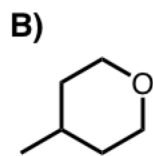
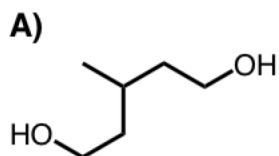
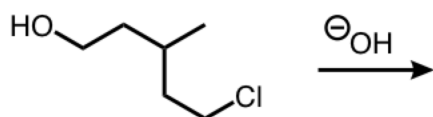
☐ all sets



Question 7

0.5 / 0.5 pts

What will be the major organic product formed in this reaction?



☐ A

☒ B

☐ C

☐ D

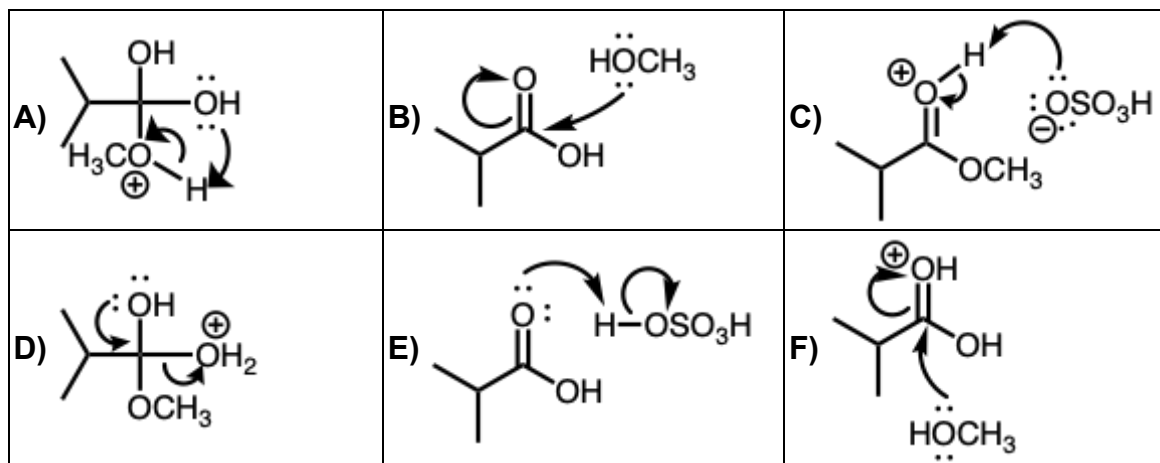
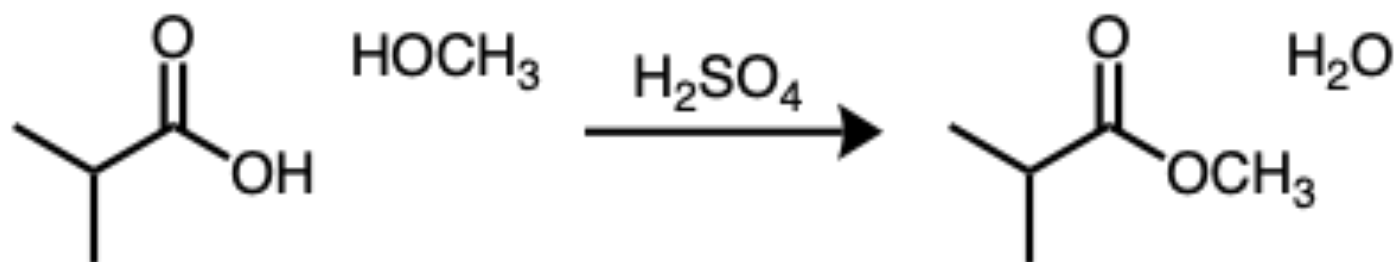


Question 8

0.5 / 0.5 pts

Consider the Fischer esterification reaction shown below to answer problems 8-11. Place the arrow-pushing mechanism steps in the order that they occur during the reaction. One image will

not be used.



Step 1

E

Step 2

F

Step 3

A

Step 4

D

Step 5

C



Question 9

0.25 / 0.25 pts

Reconsider the 5 mechanistic steps you chose in the previous problem. Which of these arrow-

pushing step corresponds to the **first** step of a S_NAc mechanism?

- ☐ A
- ☐ B
- ☐ C
- ☐ D
- ☐ E
- ☒ F



Question 10

0.25 / 0.25 pts

Again reconsider the 5 mechanistic steps you chose. Which of these arrow-pushing step corresponds to the **second** step of a S_NAc mechanism?

- ☐ A
- ☐ B
- ☐ C
- ☒ D
- ☐ E
- ☐ F



Question 11

0.25 / 0.25 pts

Identify the S_NAc step in which the nucleophile attacks the electrophile. What is the LUMO in this mechanistic step?

- ☐ S-O π^* bond
- ☐ S-O σ^* bond
- ☐ O p orbital
- ☒ C-O π^* bond

Quiz Score: 5 out of 5