

Chemistry 351

Quiz #7

October 23, 2019

Name: _____

Student Number: _____

Section Number: _____

TA: _____

INSTRUCTIONS:

This quiz consists of 7 questions on 3 pages. Please make certain that your quiz is complete.

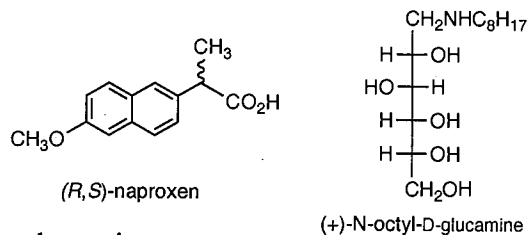
Write your name, student number, and section number **on both the quiz and answer sheet. Be certain to bubble in your PID digits on the answer sheet. The absence of any of these identification items will result in the deduction of 2 points from your score.**

Questions 1-6 are each worth 1 point. Question 7 is worth 4 points.

Write your answers to Questions 1-6 on the enclosed answer sheet. **Write your answers to Question 7 in the space provided on this quiz.**

When you complete the quiz, insert your answer sheet into your quiz and then hand both in on the bench in front of the lecture hall in the spot indicated by your section number.

1. Identify which three of the following statements are correct regarding the enantiomeric resolution of (*R,S*)-naproxen using (+)-*N*-octyl-*D*-glucamine:



1. (*R,S*)-Naproxen is first reacted with (+)-*N*-octyl-*D*-glucamine to form exclusively the conjugate base of (*S*)-naproxen with (+)-*N*-octyl-*D*-glucamine.
2. (*R,S*)-Naproxen is first reacted with (+)-*N*-octyl-*D*-glucamine to form both the conjugate base of (*S*)-naproxen with (+)-*N*-octyl-*D*-glucamine and the conjugate base of (*R*)-naproxen with (+)-*N*-octyl-*D*-glucamine.
3. The key feature of the resolution is the crystallization of the exclusively formed conjugate base of (*S*)-naproxen with (+)-*N*-octyl-*D*-glucamine from methanol/toluene.
4. The key feature of the resolution is the diastereomeric relationship and resulting different solubilities in methanol/toluene of the conjugate bases of (*S*)-naproxen and (*R*)-naproxen with (+)-*N*-octyl-*D*-glucamine.
5. (*S*)-Naproxen is released from its conjugate base with (+)-*N*-octyl-*D*-glucamine upon addition of NaOH.
6. (*S*)-naproxen is released from its conjugate base with (+)-*N*-octyl-*D*-glucamine upon addition of HCl.

a. 1,3,5 b. 2,3,5 c. 1,4,5 d. 2,4,5 e. 1,3,6 f. 2,3,6 g. 1,4,6 h. 2,4,6

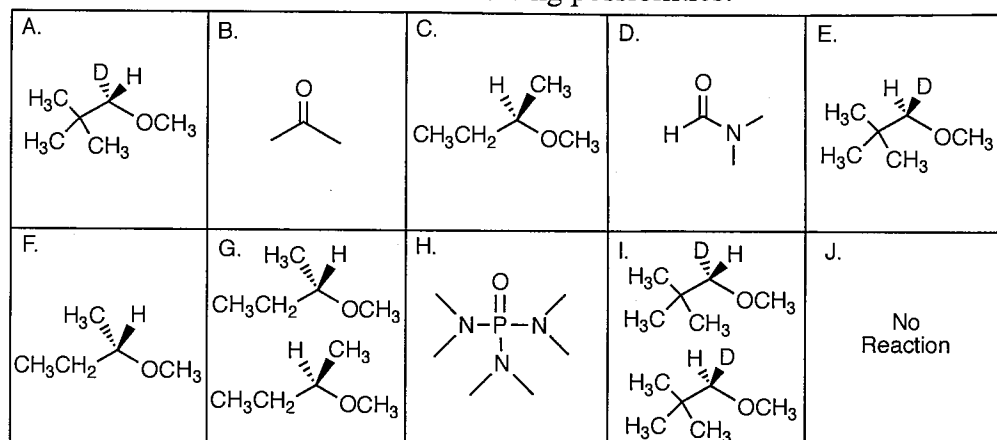
2. Identify the order of nucleophilicities in CH_3OH from strongest nucleophile to weakest nucleophile for Cl^- , I^- , F^- , and Br^- :

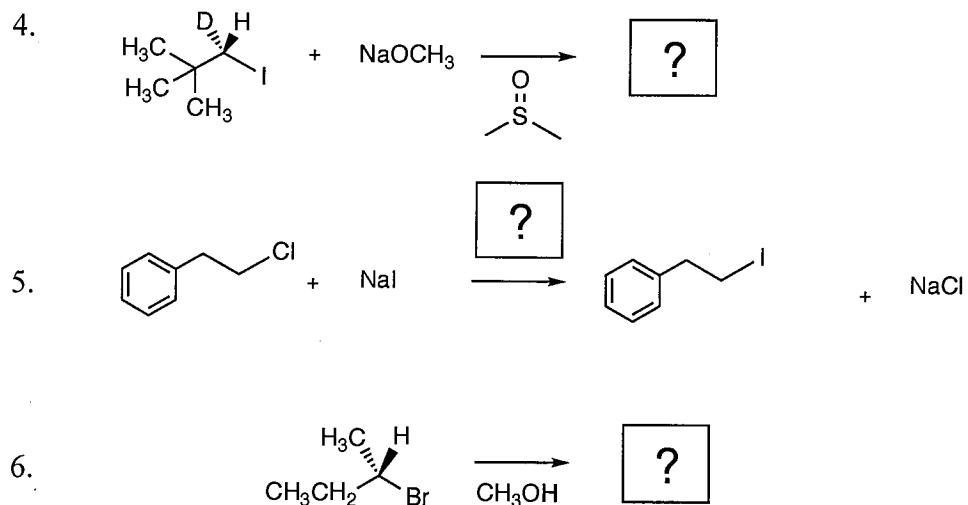
a. $\text{Cl}^- > \text{I}^- > \text{F}^- > \text{Br}^-$ b. $\text{I}^- > \text{Cl}^- > \text{F}^- > \text{Br}^-$ c. $\text{F}^- > \text{I}^- > \text{Cl}^- > \text{Br}^-$ d. $\text{Br}^- > \text{I}^- > \text{F}^- > \text{Cl}^-$
 e. $\text{I}^- > \text{Br}^- > \text{Cl}^- > \text{F}^-$ f. $\text{Cl}^- > \text{F}^- > \text{I}^- > \text{Br}^-$ g. $\text{Cl}^- > \text{Br}^- > \text{F}^- > \text{I}^-$ h. $\text{F}^- > \text{Cl}^- > \text{Br}^- > \text{I}^-$

3. Identify the order of nucleophilicities in polar aprotic solvent from strongest nucleophile to weakest nucleophile for HO^- , H_2N^- , F^- and NH_3

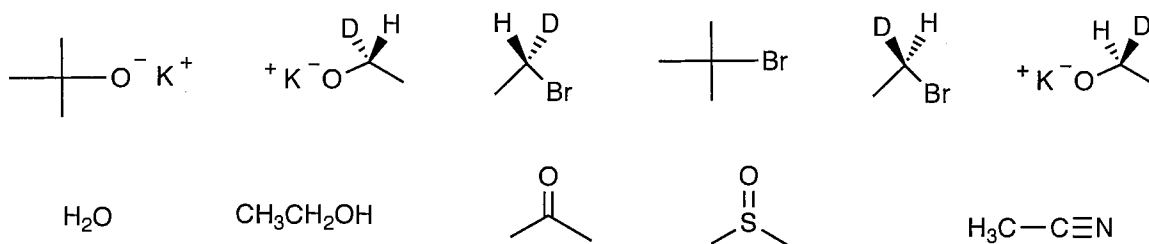
a. $\text{HO}^- > \text{H}_2\text{N}^- > \text{F}^- > \text{NH}_3$ b. $\text{H}_2\text{N}^- > \text{HO}^- > \text{F}^- > \text{NH}_3$ c. $\text{F}^- > \text{H}_2\text{N}^- > \text{HO}^- > \text{NH}_3$
 d. $\text{NH}_3 > \text{H}_2\text{N}^- > \text{F}^- > \text{HO}^-$ e. $\text{HO}^- > \text{F}^- > \text{H}_2\text{N}^- > \text{NH}_3$ f. $\text{NH}_3 > \text{H}_2\text{N}^- > \text{HO}^- > \text{F}^-$
 g. $\text{H}_2\text{N}^- > \text{NH}_3 > \text{F}^- > \text{HO}^-$ h. $\text{H}_2\text{N}^- > \text{HO}^- > \text{NH}_3 > \text{F}^-$ i. $\text{F}^- > \text{NH}_3 > \text{HO}^- > \text{H}_2\text{N}^-$

Questions 4-6 are to be answered from the following possibilities:





7. (4 pts.) Synthesize 1-(*R*)-ethyl-*t*-butyl ether (see structure below) as your ONLY product using the molecules listed below:



- Draw the structures of the reagents that you will use to synthesize 1-(*R*)-ethyl-*t*-butyl ether as your ONLY product in the labeled box.
- Draw the structure of the solvent that you would use for the reaction in the labeled box.
- Provide arrow or arrows showing the flow of electrons during the reaction leading to 1-(*R*)-ethyl-*t*-butyl ether.

