Organic SI Review #3
Tuesday, November 14th
Van Es 101, 5:00-6:30 PM

*Answers will not be posted...you must attend the review session to get the solutions!

“Remember, when you procrastinate you choose last.” -Incubus
1. Considering an $S_{N}2$ reaction, choose the more reactive nucleophile. (Consider only the $S_{N}2$ reaction for this question; ignore E2 reactions.) Briefly explain.

   a. $H_2O$ vs. $OH^-$
   b. $CH_3CO_2^-$ vs. $CH_3O^-$
   c. $SH^-$ vs. $NH_3$

2. Explain why reaction (a) does not readily undergo E2 elimination whereas reaction (b) readily reacts with the strong base to yield an alkene.

   (a)

   ![Diagram](attachment:diagram1.png)

   (b)

   ![Diagram](attachment:diagram2.png)

   Also, consider reaction (b). Will adding heat increase the reaction rate? Why or why not?

3. Your lab partner is struggling with the following $S_{N}2$ reaction. Give them a few suggestions to improve their reaction.

   ![Diagram](attachment:diagram3.png)
4. Using stereochemistry, show the product(s) of the following S\textsubscript{N}1 reaction. To help yourself out, consider the reaction mechanism.

![Chemical structure](image)

Also, to increase the reaction rate, you should increase the concentration of which chemical(s)?

5. Label ALL of the stereogenic centers as R or S in the following molecules.

![Chemical structures](image)
6. Label the following as identical, enantiomers, diastereomers, or constitutional isomers.
7. Complete the following reactions. If there is no reaction, write “NO REACTION.”

- KMnO₄
- Li
- NH₃
- Li
- NH₃
- 1. O₃
- 2. Zn/H⁺

- NaNH₂
- CH₃CH₂Br

- OH
- HCl

- CN⁻
- DMF

- O-Tos

- Cl
8. Finally, complete the following syntheses. More than one step will be required.
9. I know that my really bad chemistry jokes are lame. But seriously, SI is the only place that people will actually listen to me. So, here it is…What did the gambler do with his playing cards?