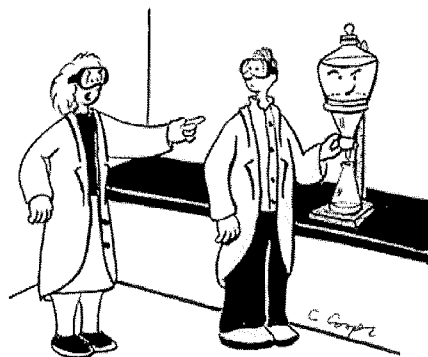


Organic Chemistry I  
SI Review: Exam III  
Tuesday, November 13  
Stevens Auditorium  
6:00-8:00 PM

*What am I?*

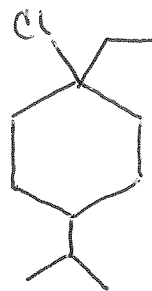
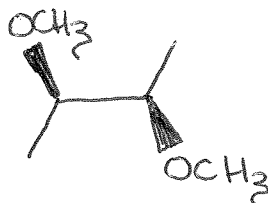
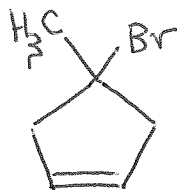
*I bear two gifts; not one or three,  
Earthbound yet I roam the sea,  
All brilliant white,  
I head you ache,  
Fond of milk, averse to cake.*

- J. Chem. Ed., 12/94, Doris Eckey

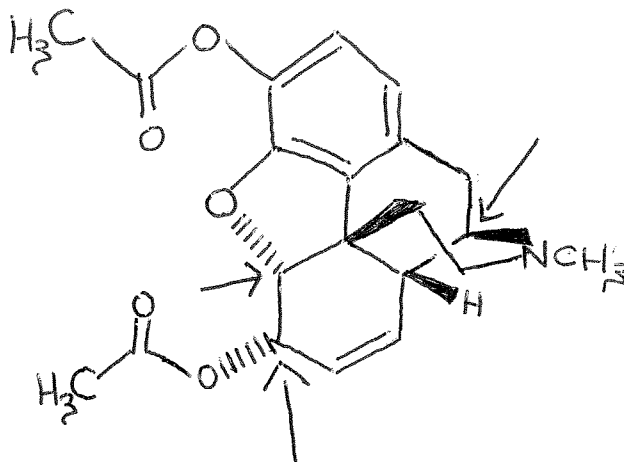


"And I'll thank you to wipe that smirk off your phase!"

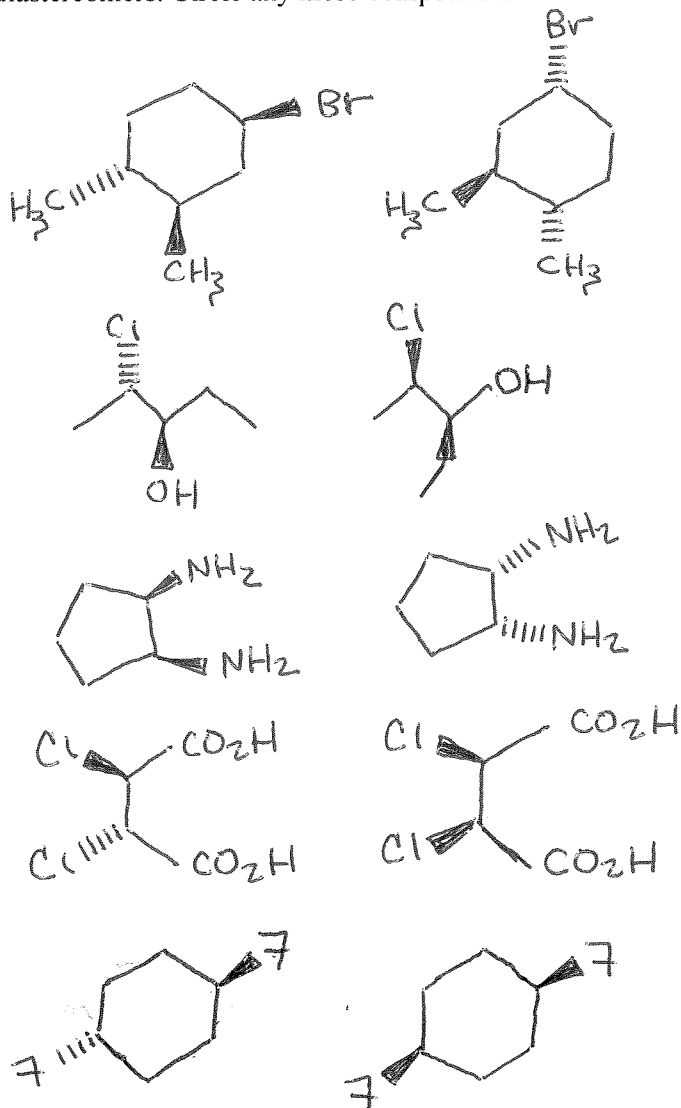
1. Which of the following compounds are optically active?



2. Identify the configurations of the stereogenic carbons labeled with arrows; the structure shown below is heroin.

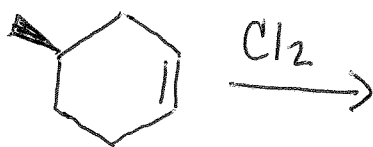


3. Identify the relationships between the following compound pairs: identical, enantiomers or diastereomers. Circle any meso compounds.



\*Which pairs would have identical physical properties (MP, BP, solubility, density, etc.)?\*

4. The reaction below yields a mixture of a) enantiomers or b) diastereomers. Draw the two stereoisomers formed. Is the overall product optically active?

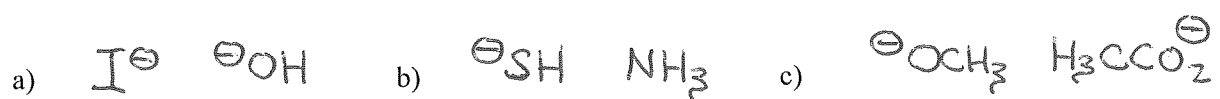


5. Draw the following compounds:

a) (3*S*, 5*R*)-3-Bromo-5-chloro-1-heptyne

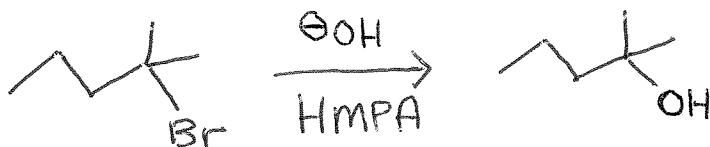
b) (1*R*, 2*R*)-1-Bromo-2-methylcyclopentane

6. In the following pairs of molecules, indicate the better nucleophile for an S<sub>N</sub>2 reaction.

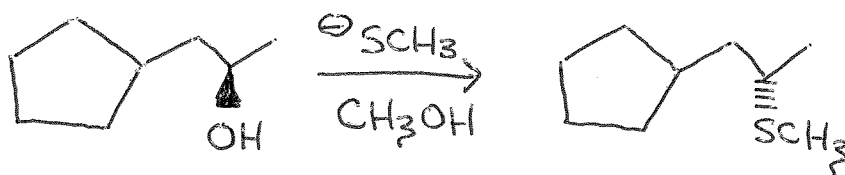


7. Identify any problems with the following reactions. (Hint: take into account optimal substrate, nucleophile, solvent and leaving group for S<sub>N</sub>1 and S<sub>N</sub>2 reactions).

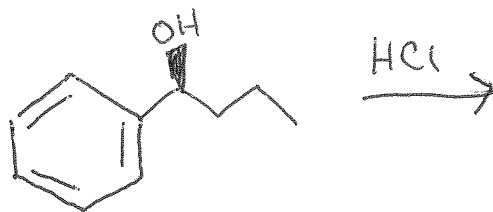
Your S<sub>N</sub>1 reaction is not taking place as shown:



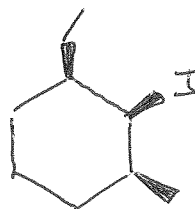
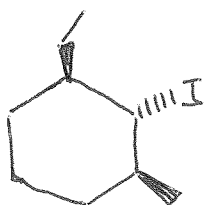
It's been a rough day, as your S<sub>N</sub>2 reaction has also not been successful:



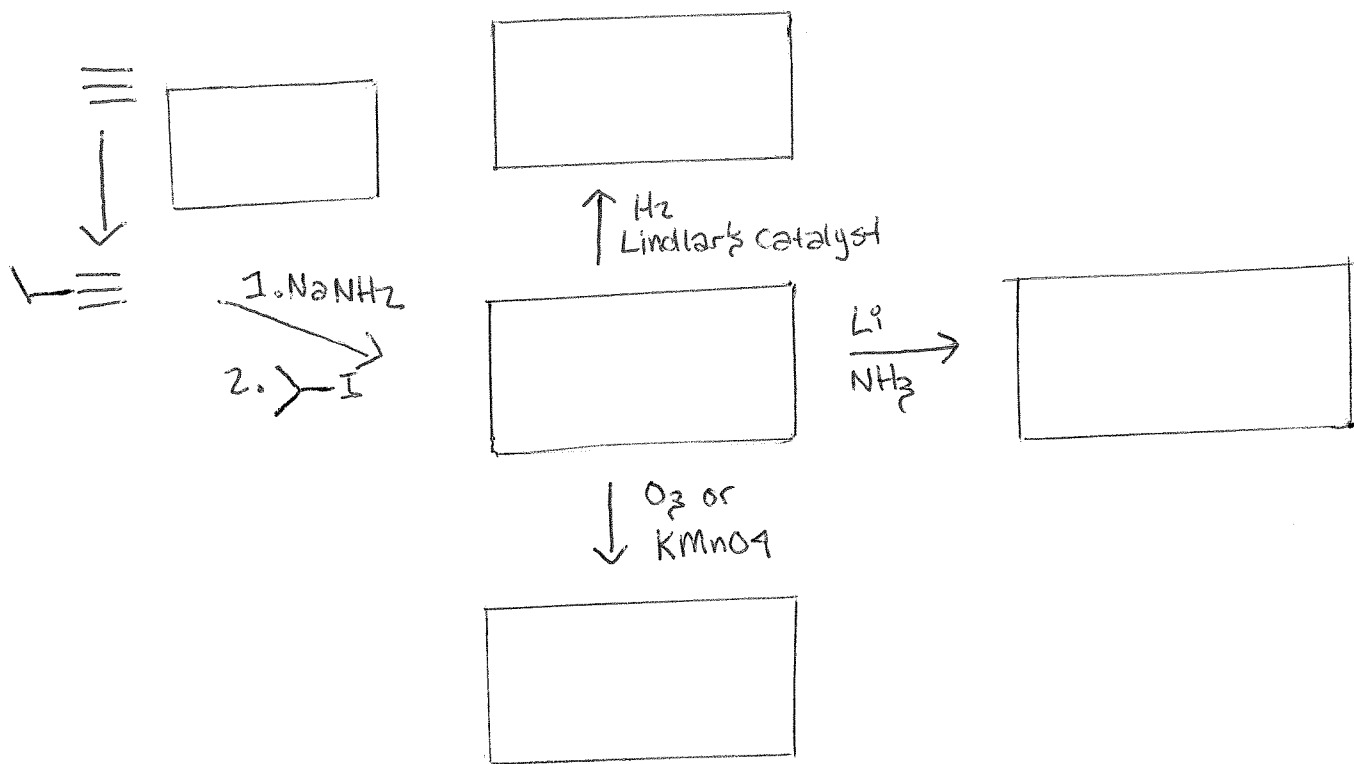
8. Provide the mechanism for the following  $S_N1$  reaction and any product formed. Would doubling concentration of the nucleophile in this reaction affect the reaction rate?

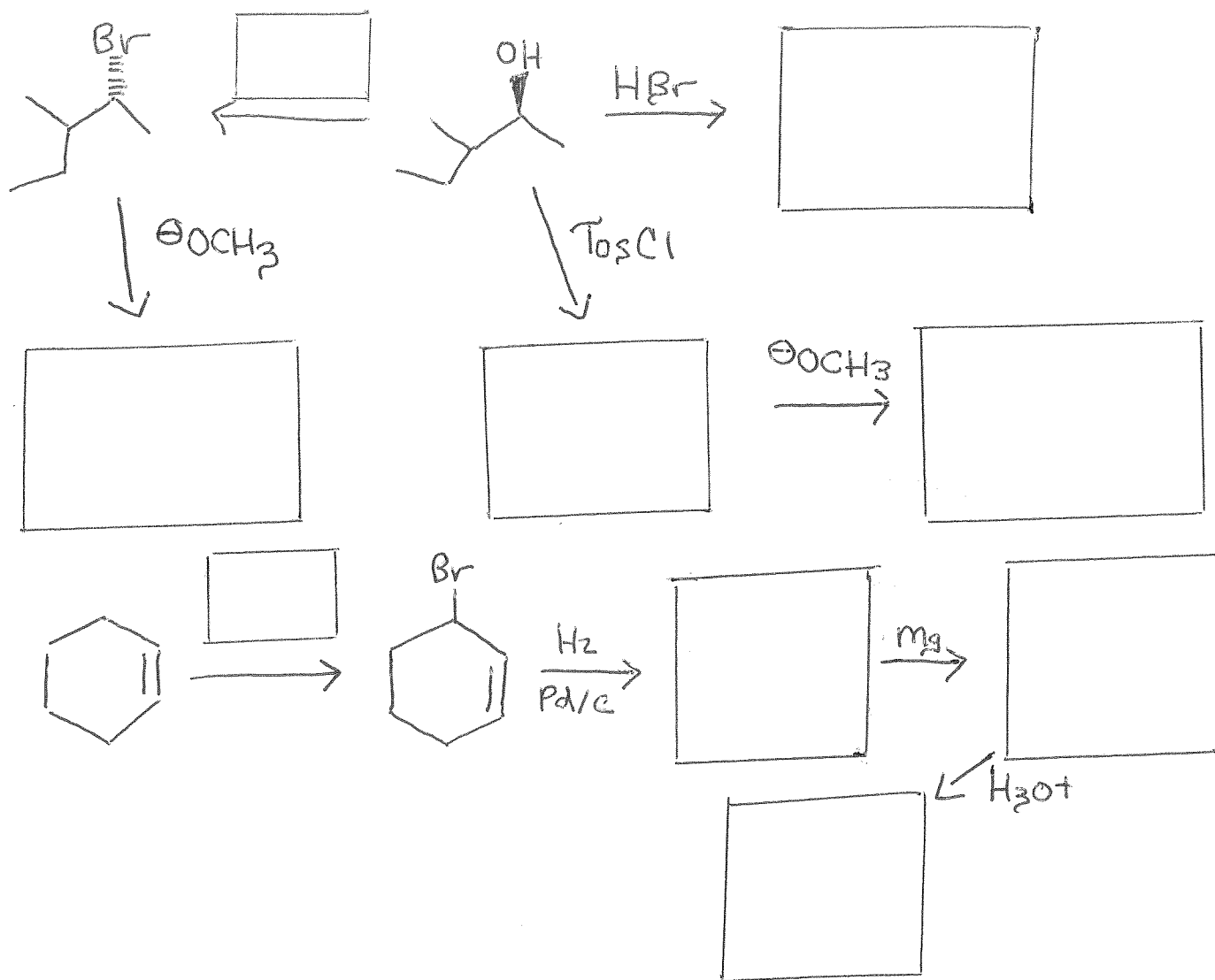


9. Which of the following two molecules would yield an alkene in an E2 reaction? Explain in the space below.

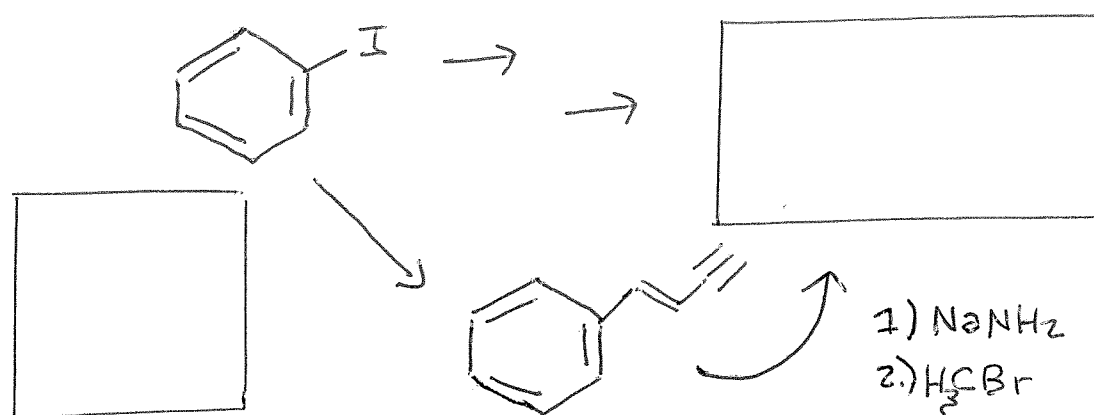


10. Fill in missing starting material, reagents or product as needed. Note stereochemistry where applicable.





11. In the following synthesis, fill in any missing starting material, reagents or product.



"Electricity? Biology? Seems to me it's chemistry." -Rush (*Signals*, 1983)