

Exam 3
Chem 22
April 2, 2010

Name Gary Snyder

page 1 (25) _____

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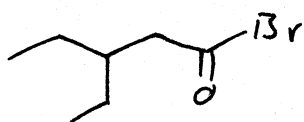
total (100)

chk

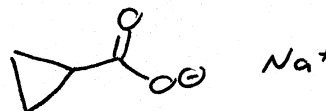
Kindly avoid doodling in this space.

1. (17 points) Draw. Show stereochem where relevant; don't abbreviate groups.

(a) 3-ethylpentanoyl bromide



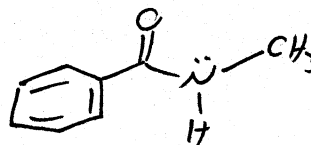
(b) sodium cyclopropanecarboxylate



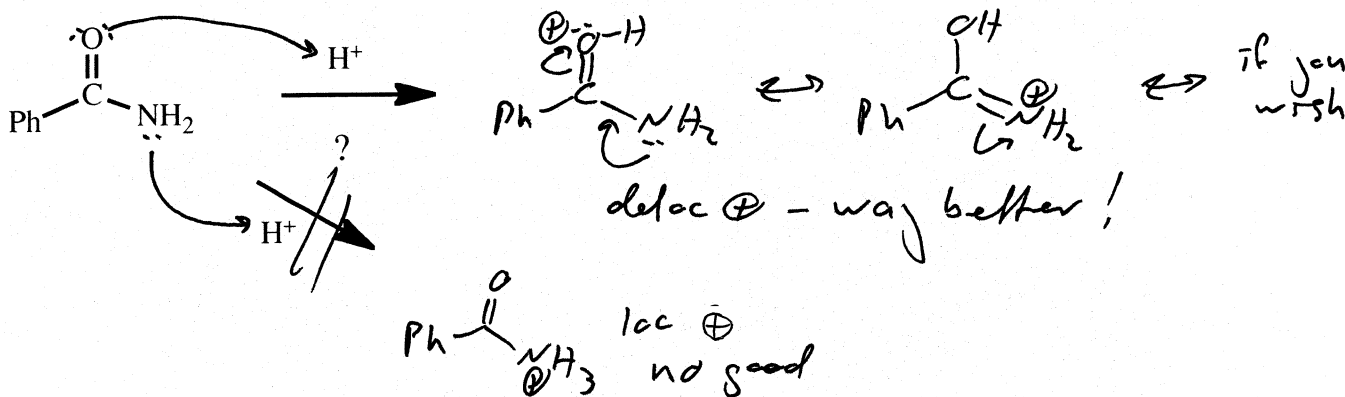
(c) *tert*-butyl 3-butynoate



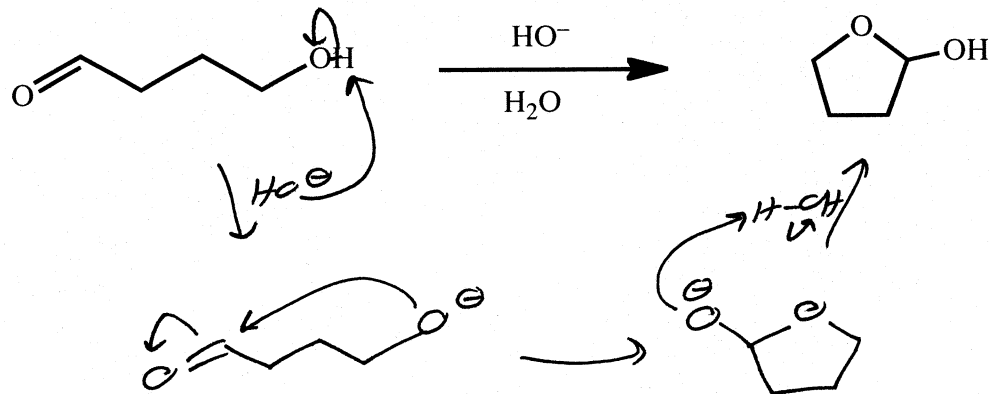
(d) *N*-methylbenzamide



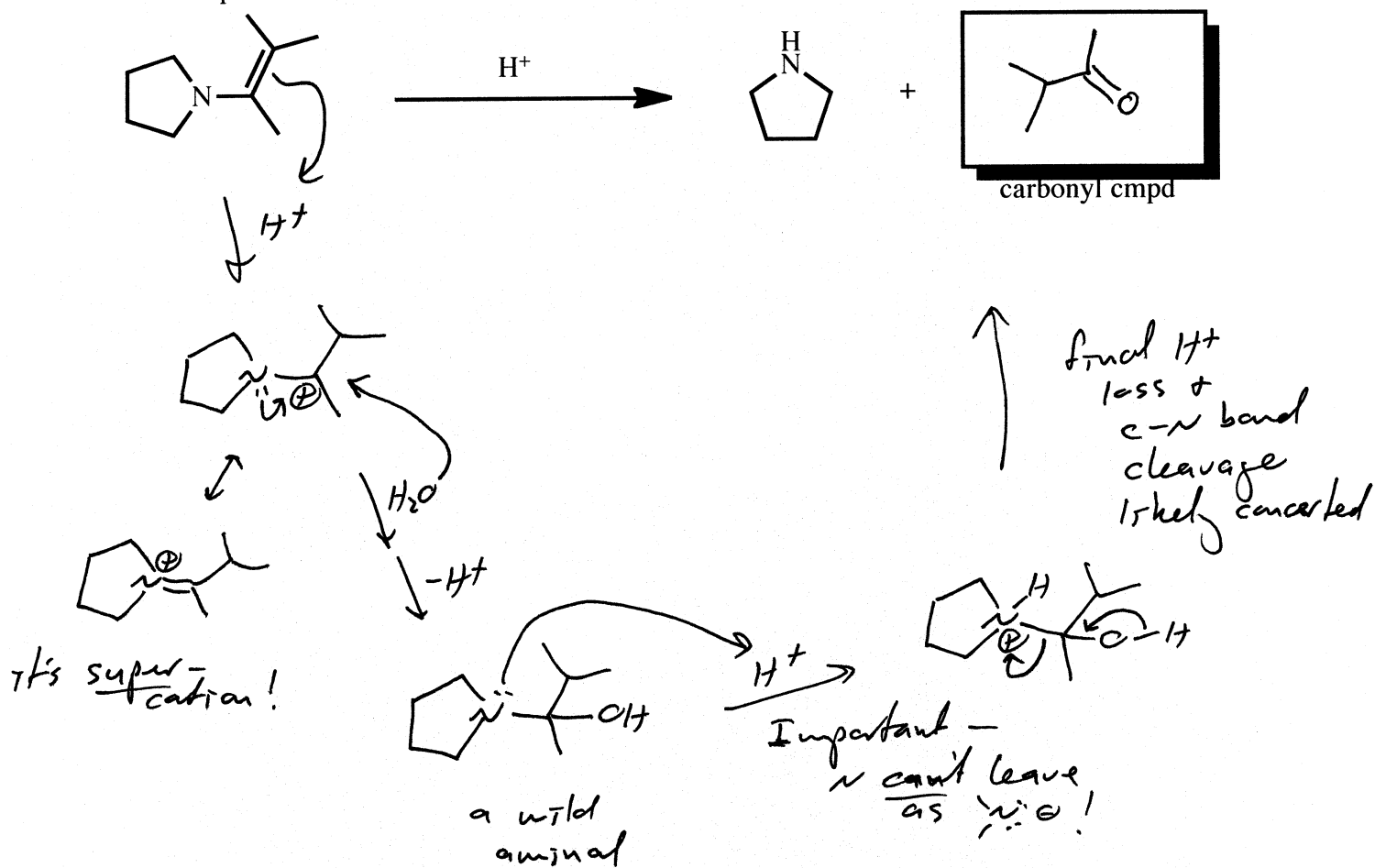
2. (8 points) Amides can, in principle, be protonated on N or O. Which conjugate acid is more stable and why? Be concise, and draw relevant structures.



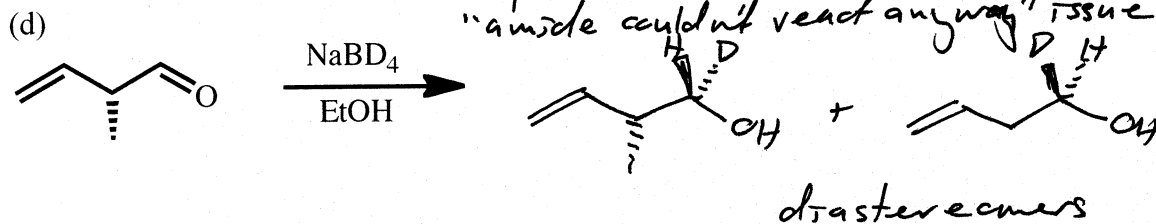
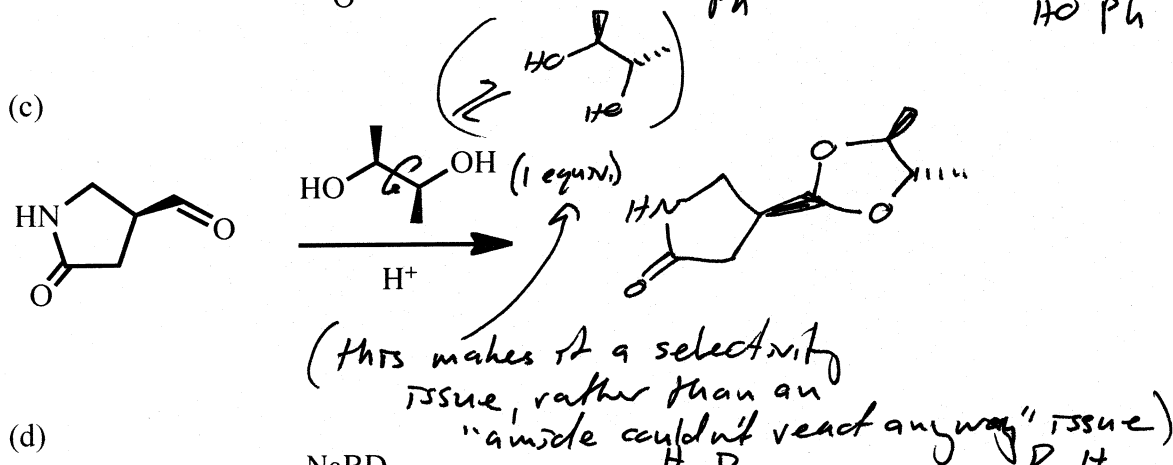
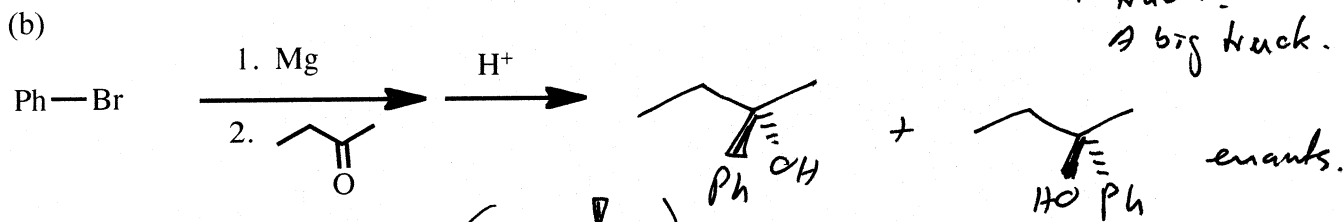
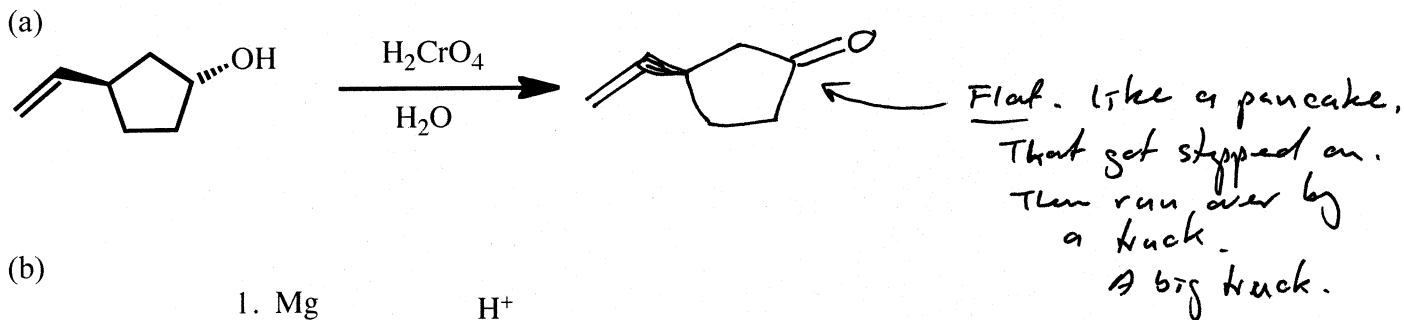
3. (8 points) Write the mechanism of the base-catalyzed hemiacetal formation below. Show every step explicitly, including proton transfers; **do not abbreviate** these as "+H⁺" and "-H⁺".



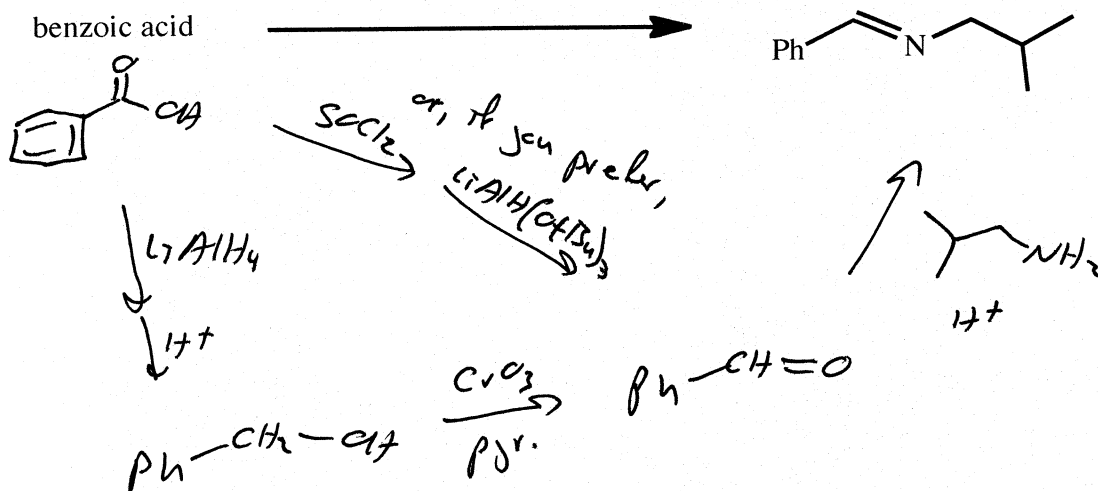
4. (17 points) Write the mechanism of the following enamine hydrolysis, and draw the carbonyl-containing product in the box. You may abbreviate steps as "+H⁺" and "-H⁺" this time; just be sure the sequence is clear and reasonable.



5. (21 points) Draw the products of the following reactions, including stereochemistry, where relevant. Label products to indicate stereoisomeric relationships as appropriate.

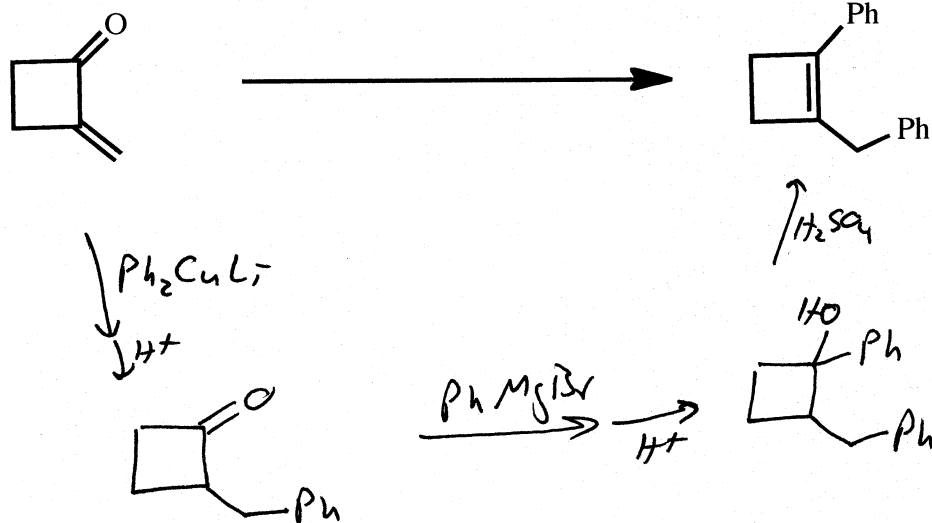


6. (9 points) Suggest a synthesis of the imine below from benzoic acid.

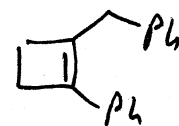


7. (25 points) Suggest synthetic routes for carrying out the following transformations.

(a)



drat! I should have spun it 'round like this:



(insert maniacal laughter here)

(b) Use benzyl alcohol, benzyl bromide, or both, as your only source of aromatic rings. (note that the target is an alkene, *not* a carelessly drawn ketone!)

