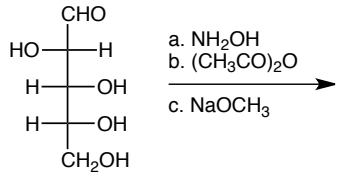
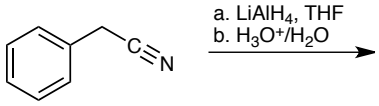
Homework Six
Organic Chemistry II (224) • Prof. Chad Landrie
Spring 2013

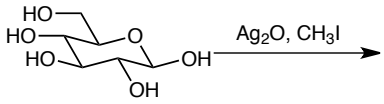
Completion (6 pts)		**Name**	
Random Sample(s) (4 pts)		**BID**	
Total (10 pts)		**Section-CRN**	

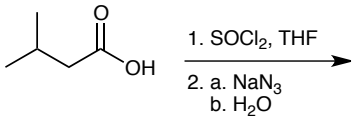
Additional Recommended Problems from McMurray (8th Ed.)	

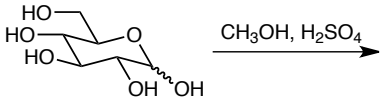
1. Draw the *major* product.

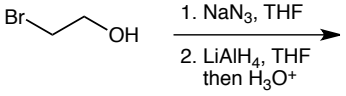


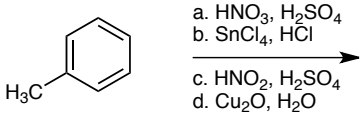


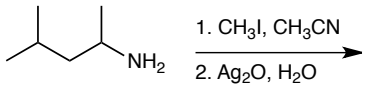


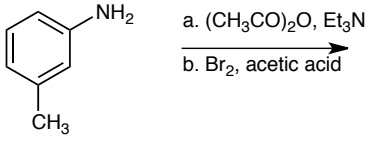


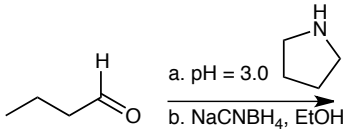


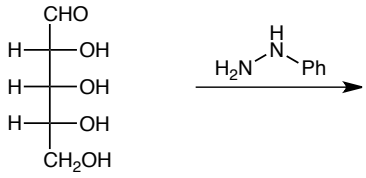


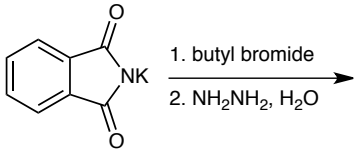












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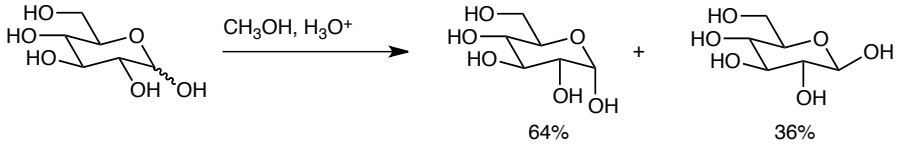
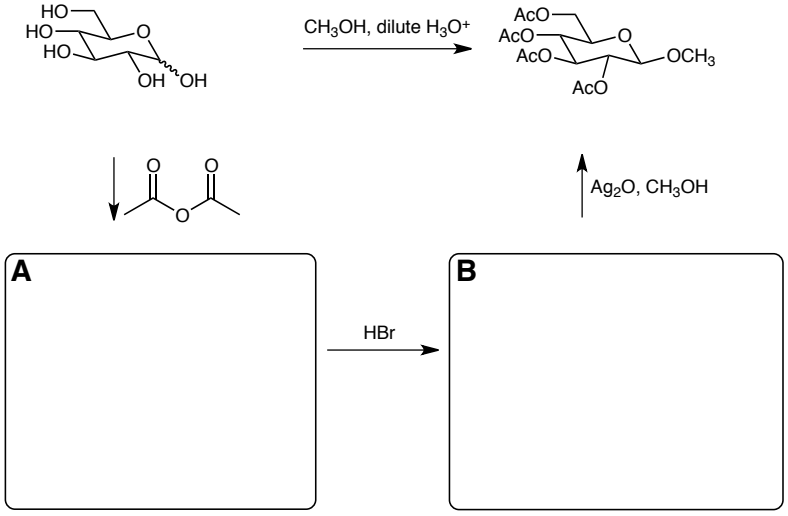
2. Treatment of glucose with methanol in dilute acid gives a mixture of α- and β-glucosides. **First**, draw the mechanism for the reaction. **Second**, explain why the β-anomer is the major product.



3. Consider the Koenigs-Knorr synthesis below in which only the methyl β-glucopyranoside is isolated. **First**, draw the structures of intermediates **A** and **B**. **Second**, draw a mechanism for the conversion of **B** to the product. Be sure to show how silver participates in this mechanism. Your mechanism should also account for the fact that only the β-anomer is formed.



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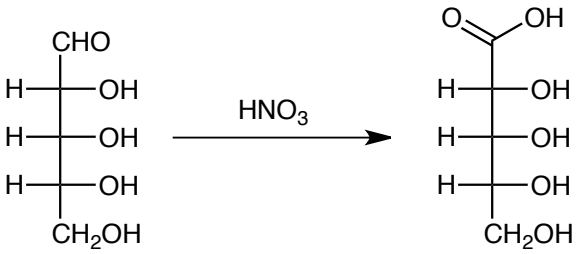
4. The specific optical rotation, $[\alpha]_D$, of a solution of glucose was measured to be 25º before it gradually changed to 52º. Using the specific optical rotations of each pure glucose anomer, determine the enatiomeric excess of the original solution.

   $[\alpha]_D$ α-D-glucopyranose = 112º
   $[\alpha]_D$ β-D-glucopyranose = 19º

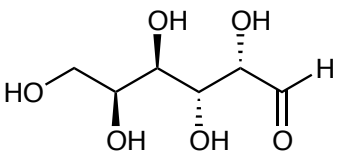
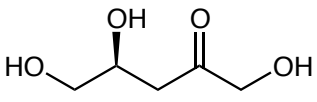
5. Nitric acid can be used to oxidize aldoses. Draw a mechanism for the transformation below.



6. Draw an example of each monosaccharide. Draw open-chain (acyclic) forms unless the name indicates otherwise.

β-glucopyranose	*α*-fructofuranose	D-aldohexose	L-ketohexose

7. Draw the Fischer projection for each carbohydrate.

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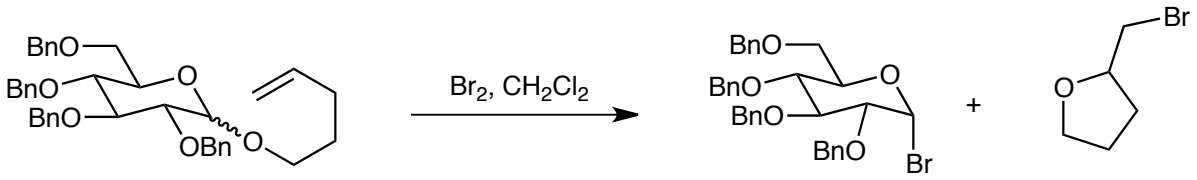
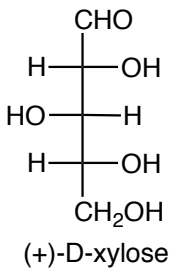
8. Pentenyl glycosides are glycosyl donors as illustrated by their conversion to glycosyl bromides with bromine. Write a mechanism for this reaction that accounts for both products.



9. Refer to the Fischer projection of (+)-D-xylose and then draw structural formulas for each derivative.

 (+)-D-xylose	(-)-xylose (Fischer)	xylitol	β-D-xylopyranose	α-L-xylofuranose
methyl α-L-xylofuranoside	D-xylonic acid (Fisher)	δ-lactone of D-xylonic acid	γ-lactone of D-xylonic acid	xylaric acid (Fischer)