

CHEM 3311

HARRINGTON

Exam 3 7:00 – 8:30 PM April 18, 2017 in HUMN1B50

Instructions. No notes, books, laptops, phones, calculators, models or drawing stencils.

Periodic Table, electronegativity chart, and Table of Nucleophile/Base pK_b Values are provided.

NAME:

Recitation TA Name:

	Points Possible	Score
1	16	
2	16	
3	15	
4	12	
5	16	
6	14	
7	11	
Exam 3 Total Raw Score	100	
Curve		
Exam 3 Curved Score		
Exam 3 Letter Grade		

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1(16 points). Draw a structure corresponding to each IUPAC name. The structure should show the R or S stereochemistry at each chiral C.

(1R,2S)-2-methylcyclohept-4-enol

(2R,3R)-2,3-dibromobutane

(R)-4,4-dimethyl-3-propoxyheptane

(R)-1-mercaptopropan-2-ol

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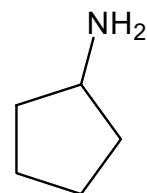
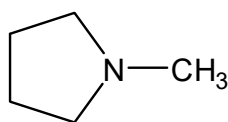
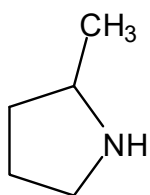
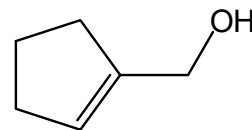
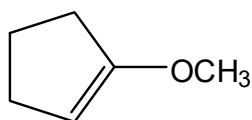
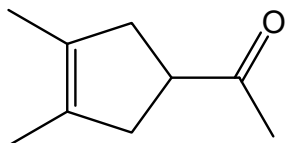
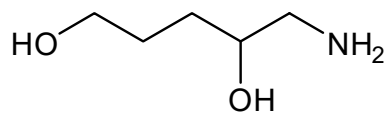
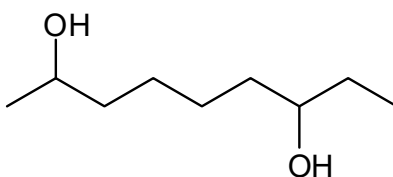
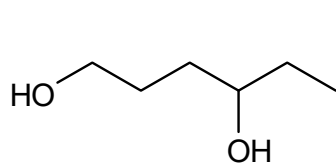
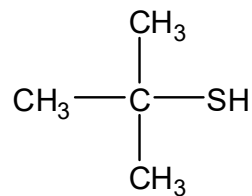
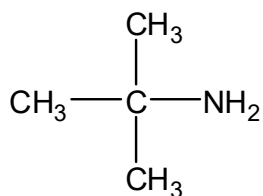
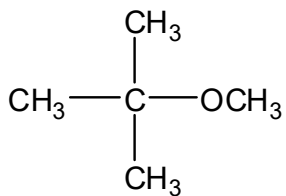
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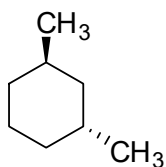
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2. (16 points) For each set of three compounds, indicate which compound is most water-soluble and which is least water-soluble.

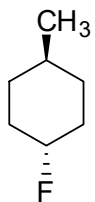


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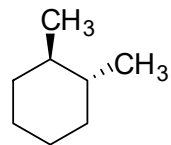
3. (15 points) Part A. Label each cyclohexane as chiral or achiral.



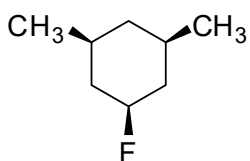
A



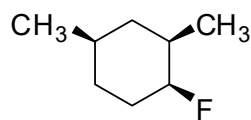
B



C



D



E

Part B. Draw the most stable chair conformation for each cyclohexane from Part A.

(NOTE: You can use the back of the previous page to practice drawing chair structures but the structure to be graded must be drawn in the space provided below.)

A

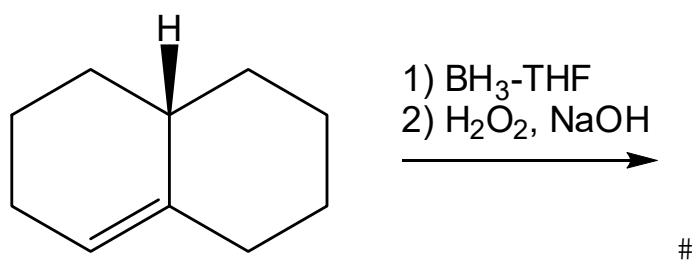
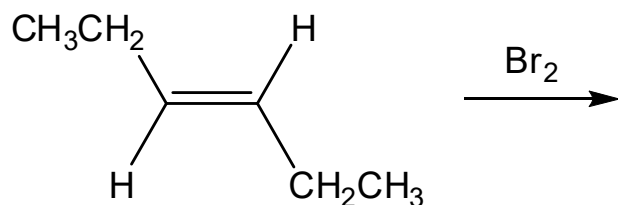
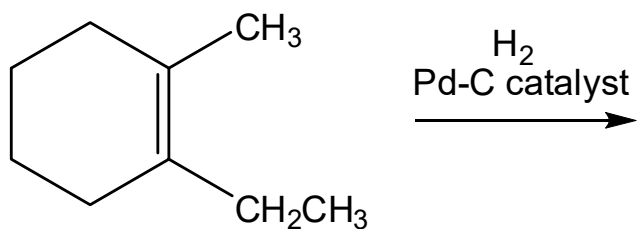
B

C

D

E

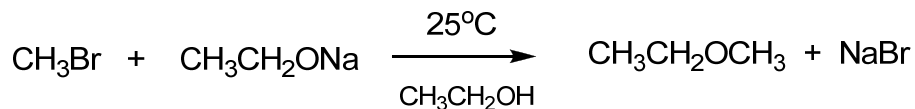
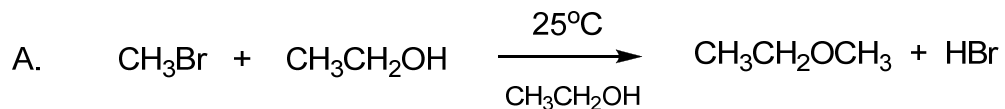
4. (12 points) Draw structures for the stereoisomeric products you would expect to form in each of the following reactions. Each structure should show the R or S stereochemistry at each chiral C.



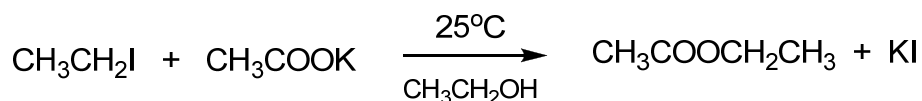
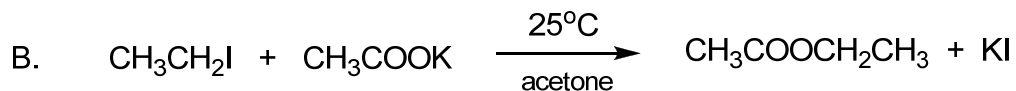
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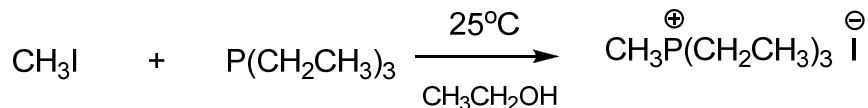
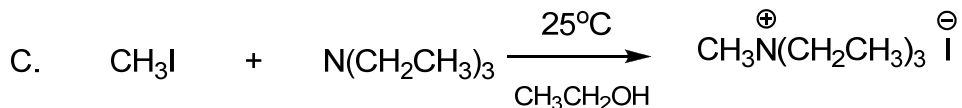
5. (16 points) For each pair of S_N2 reactions, identify the reaction with the faster rate. Explain each answer in ten words or less.



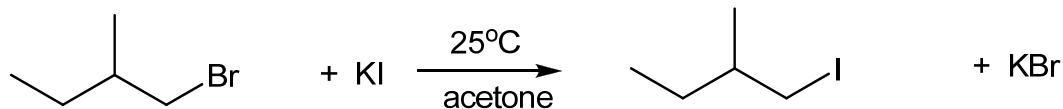
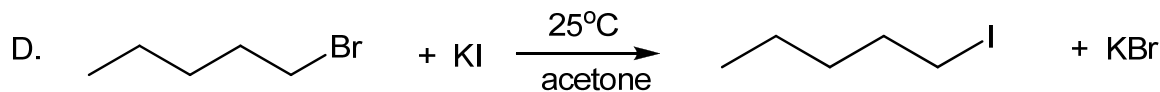
Explanation:



Explanation:

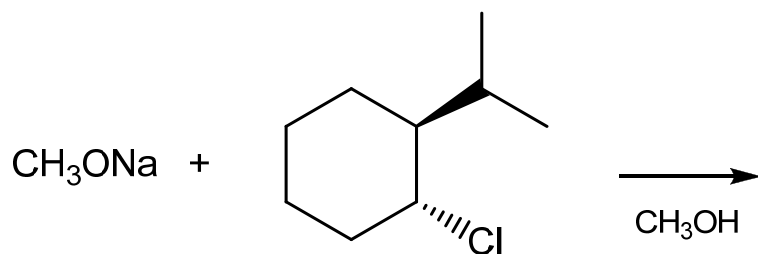
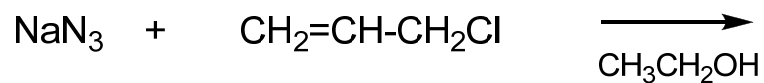
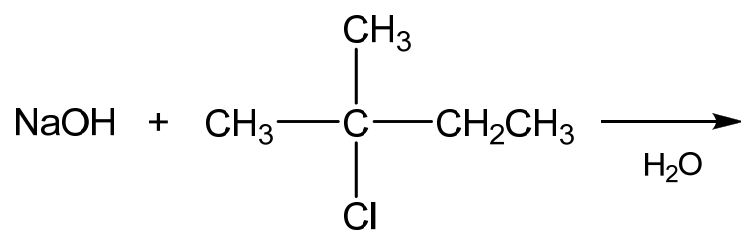
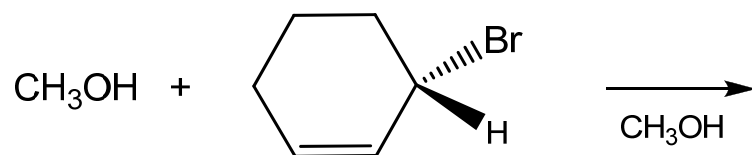


Explanation:



Explanation:

6. (14 points) Draw structures for the major organic product(s) formed in each reaction. Each product structure should clearly show the stereochemistry expected at each chiral C.



7. (11 points) Draw a complete step-by-step mechanism to account for the formation of both products. Use two-electron **arrows** to track the movement of electrons in each step.

