

Chemistry 333

Examination #2

July 1, 2002

Professor Charonnat

Name: \_\_\_\_\_

Be certain that your examination has six (6) pages including this one.

Put your name on **each** page of this examination booklet.

By putting your name on this examination booklet you agree to abide by California State University, Northridge policies of academic honesty and integrity.

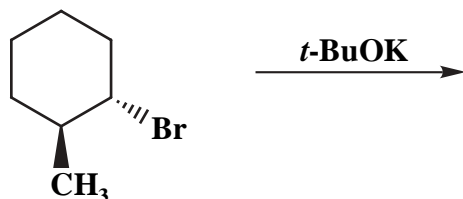
Molecular models are allowed for this examination. Calculators are unnecessary and are not allowed.

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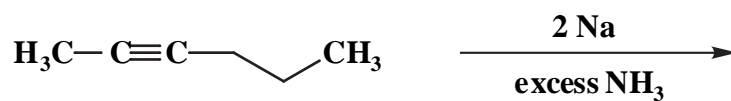
1. (25 points)

Draw the structure of the expected major organic product for each of the following five (5) questions. Clearly specify stereochemistry, if relevant.

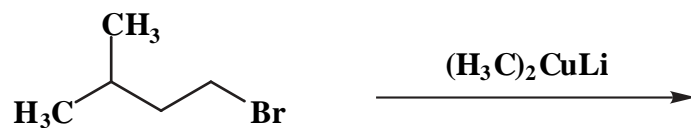
A.



B.



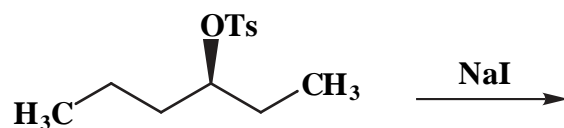
C.



D.



E.



Name: \_\_\_\_\_

2. (25 points)

Circle the number that corresponds to the correct answer for each of the following five (5) questions.

A. The rate of an E1 reaction is proportional to:

1.  $[\text{base}]^0$

2.  $[\text{base}]^1$

3.  $[\text{base}]^2$

B. S<sub>N</sub>1 reactions:

1. are always one-step processes

2. are always two-step processes

3. involve two or more steps

C. The E2 reaction of an unsymmetrical, secondary alkyl halide with a hindered base will yield:

1. the more substituted alkene

2. the less substituted alkene

3. a 1:1 mixture of the above two alkenes

D. The formation of a tertiary carbocation from the corresponding alkyl halide is:

1. exothermic

2. endothermic

3. neither exothermic nor endothermic

E. The nucleophilicity of iodide anion in tetrabutylammonium iodide is:

1. greater than the nucleophilicity of iodide anion in lithium iodide

2. less than the nucleophilicity of iodide anion in lithium iodide

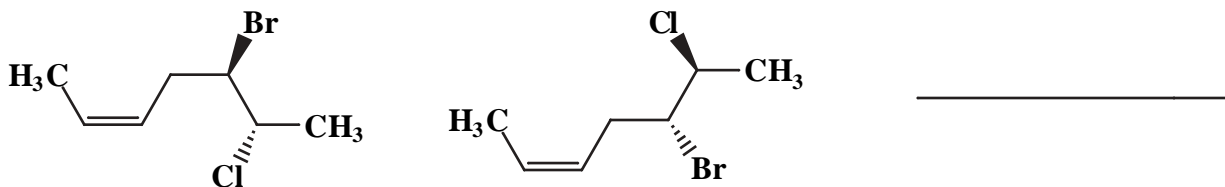
3. identical to the nucleophilicity of iodide anion in lithium iodide

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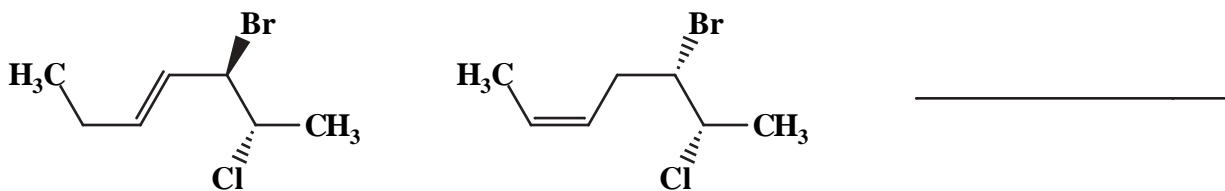
3. (25 points)

State the relationship between each of the following five (5) pairs of structures (identical, enantiomers, diastereomers, structural isomers, conformational isomers, different compounds that are not isomeric).

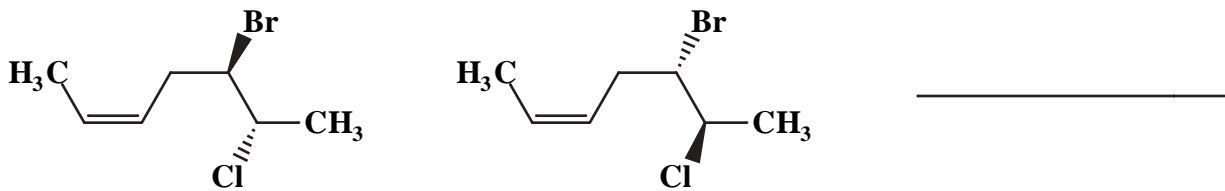
A.



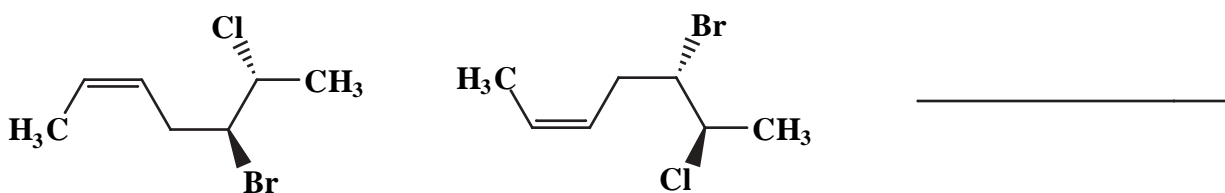
B.



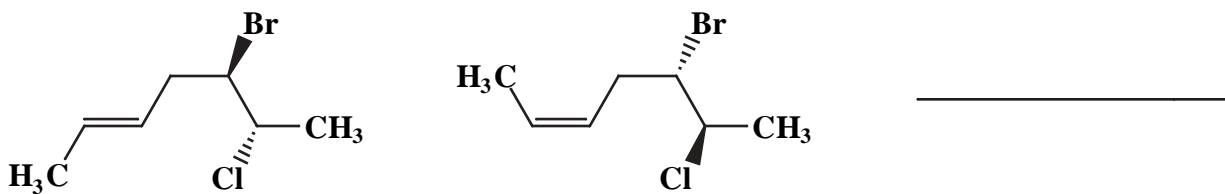
C.



D.



E.

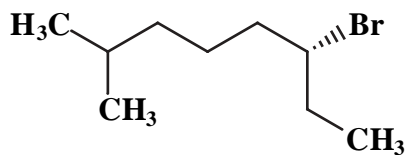


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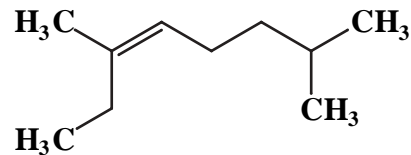
4. (20 points)

Use IUPAC nomenclature to write the systematic names of the following two (2) compounds.

A.



B.



5. (30 points)

Answer the following three (3) questions precisely, succinctly and with correct grammar. Draw specific equations to illustrate your answers.

A. Why are primary alkyl bromides more reactive than secondary alkyl bromides in  $S_N2$  reactions?

B. Why does the dehydrohalogenation of (2*R*, 3*R*)-2-bromo-3-methylpentane with sodium ethoxide give (*E*)-3-methyl-2-pentene, not (*Z*)-3-methyl-2-pentene?

C. What is meant by the term, "stereoselective reaction?"

