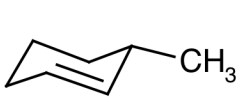
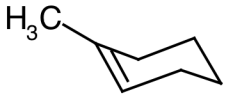
"Grade or Education" = 1

CHEM 2261/01
Summer 12
Exam 3
Chapters 7-9

1. Choose the **CORRECT** structure(s) of the **ELIMINATION** product(s) obtained from the reaction of trans-1-chloro-2-methylcyclohexane + high concentration of CH_3O^-.



1



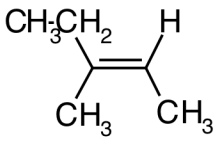
2

3

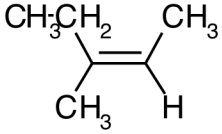
__ A. **2** and **3** are the products of this reaction.
__ B. **2** is the product of this reaction.
__ C. **1** and **3** are the products of this reaction.
__ D. **1** and **2** are the products of this reaction.
__ E. **3** is the product of this reaction.

Rationale:
Chapter 9 Problem 38c

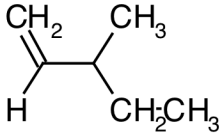
2. Find the elimination product(s) of (2R,3S)-2-chloro-3-methylpentane + high concentration of CH_3O^- among the numbered structures below. Choose the **CORRECT** product(s) of this reaction.



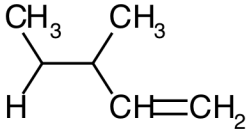
1



2



3

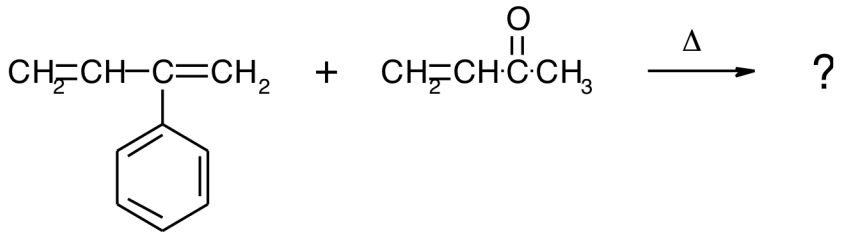


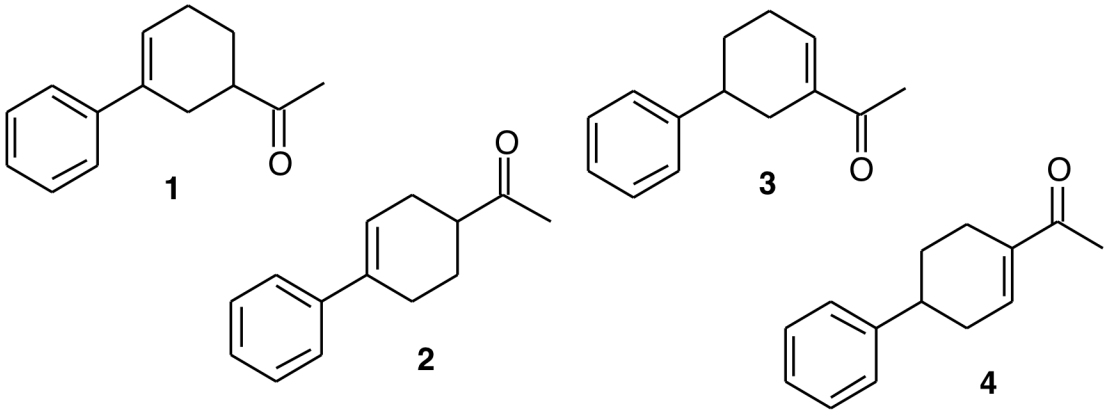
4

__ A. **2** is the product of this reaction.
__ B. **1** is the product of this reaction.
__ C. **3** is the product of this reaction.
__ D. **1** and **3** are both products of this reaction.
__ E. **4** is the product of this reaction.

Rationale:
Chapter 9 Problem 48c

3. Find the **MAJOR** product of the Diels-Alder reaction shown below among the numbered structures shown below the reaction. Make certain that you use the preferred alignment of the reactants to generate the major product. Pick the choice which gives the number found under the correct structure of this product.





__ A. **1**

__ B. **2**

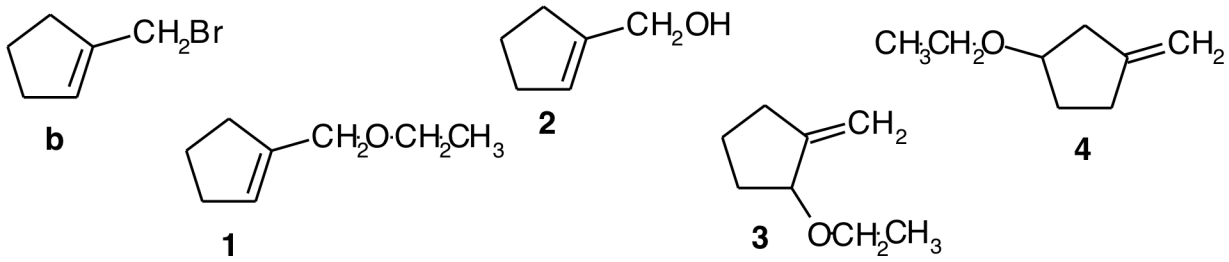
__ C. None of the numbered structures is the major product of this reaction.

__ D. **4**

__ E. **3**

Rationale:
Chapter 7 Problem 71b

4. Find **ALL** of the **CORRECT** structures of the products obtained from the solvolysis of the compound with structure **b** (shown below) in ethanol. Choose the answer which gives all of the correct product structures and no wrong structures.



__ A. The products have structures 1 and 2.

__ B. The products have structures 1 and 4.

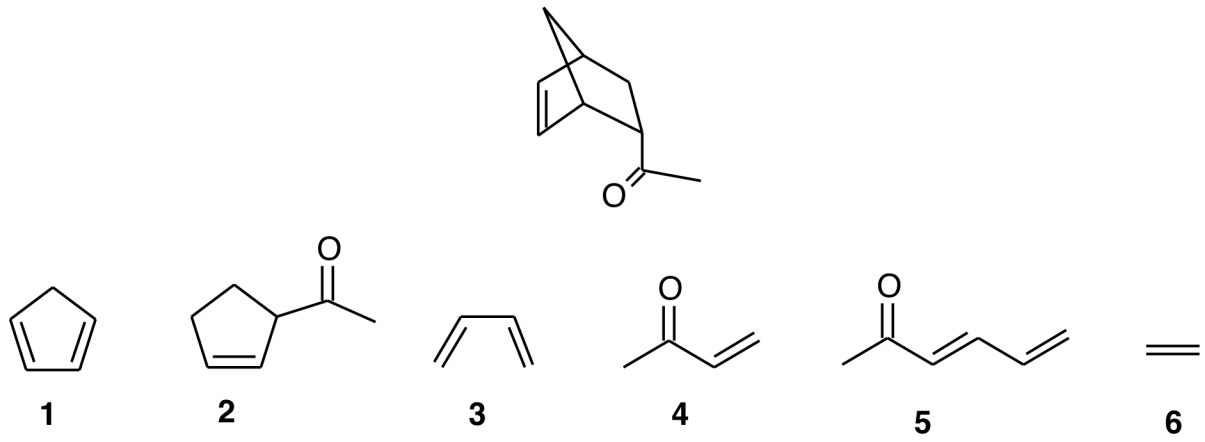
__ C. The products have structures 2 and 4.

__ D. The products have structures 2 and 3.

__ E. The products have structures 1 and 3.

Rationale:
Chapter 8 Problem 46b

5. Choose the **CORRECT** structures of the diene and dienophile which react with one another to form the compound shown below.



__ A. **3** and **4**

__ B. **1** and **5**

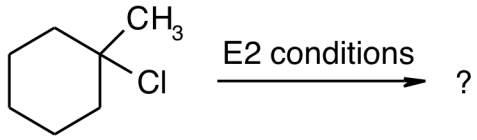
__ C. **2** and **3**

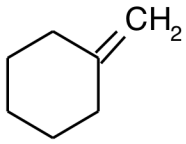
__ D. **1** and **4**

__ E. **5** and **6**

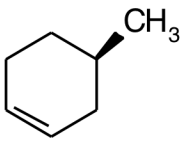
Rationale:
Chapter 7 Problem 75a

6. Choose the **CORRECT** structure of the major product obtained when the alkyl halide shown below undergoes an E2 reaction.





1



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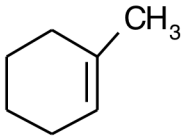
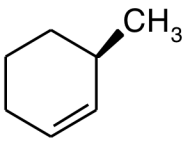
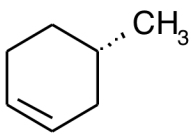


3



4



5

__ A. **3** is the major product of this reaction.

__ B. **1** is the major product of this reaction.

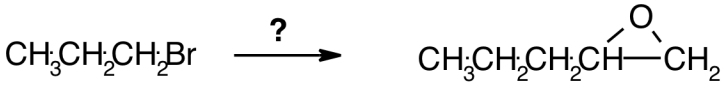
__ C. **2** is the major product of this reaction.

__ D. **5** is the major product of this reaction.

__ E. **4** is the major product of this reaction.

Rationale:
Chapter 9 Problem 32f

7. Pick the choice which describes how the synthesis depicted below could be carried out.



__ A. First react with t-BuO^-. Next react with a peracid (RCO_3H).

__ B. First react with $HC{\equiv}C^-$. Next react with H_2/Pd/C. Finally react with a peracid (RCO_3H).

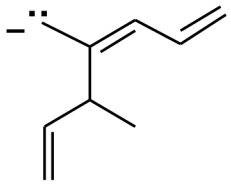
__ C. First react with t-BuO^-. Next react with Br_2/CH_2Cl_2. Next react with $NaNH_2$. Next react with Na/NH_3. Finally react with a peracid (RCO_3H).

__ D. First react with $HC{\equiv}C^-$. Next react with H_2/Lindlar catalyst. Finally react with a peracid (RCO_3H).

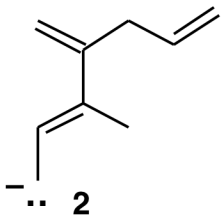
__ E. First react with t-BuO^-. Next react with Br_2/CH_2Cl_2. Next react with $NaNH_2$. Next react with H_2/Lindlar catalyst. Finally react with a peracid (RCO_3H).

Rationale:
Chapter 8 Problem 54d

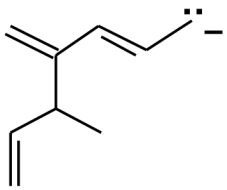
8. Pick the number of the structure which is a **CORRECT** resonance contributor for the ion labelled **1**, shown below.



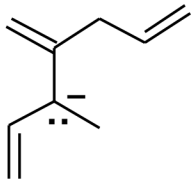
1



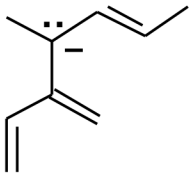
2



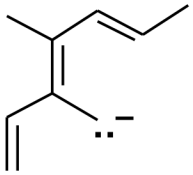
3



4



5



6

__ A. **5**

__ B. **3**

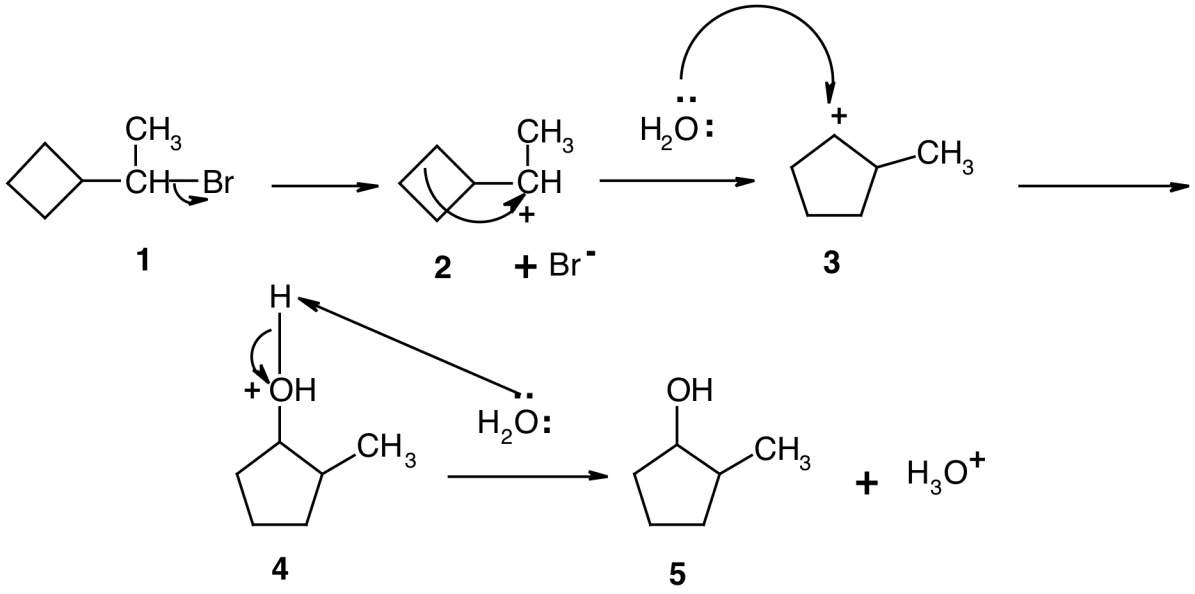
__ C. **4**

__ D. **6**

__ E. **2**

Rationale:
Chapter 7 Problem 44d

9. Shown below is a curved-arrow mechanism for converting structure **1** into structure **5**. Which structure has the curved arrow(s) associated with it drawn **INCORRECTLY**?



__ A. **2**

__ B. **3**

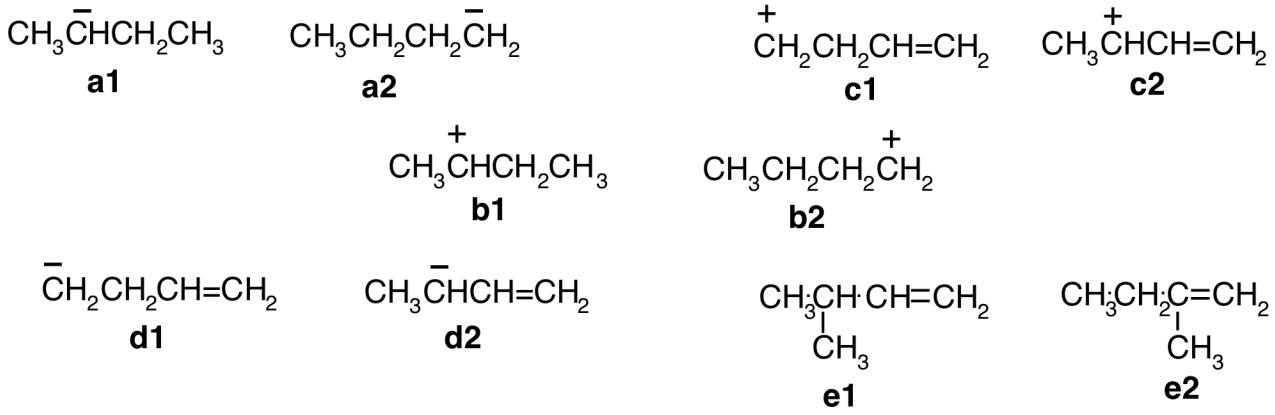
__ C. **1**

__ D. **4**

__ E. **5**

Rationale:
Chapter 8 Problem 62a

10. Figure out which species in each of the pairs shown below is more stable. Pairs of structures share the same letter, like **a1** and **a2**. Pick the **CORRECT** statement from the multiple choices.



__ A. **a1** is more stable than **a2**.

__ B. **d2** is more stable than **d1**.

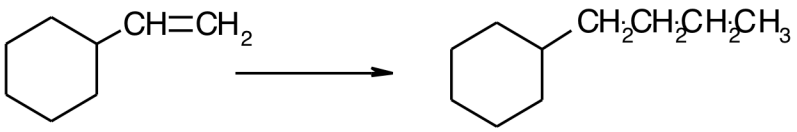
__ C. **b2** is more stable than **b1**.

__ D. **c1** is more stable than **c2**.

__ E. **e1** is more stable than **e2**.

Rationale:
Chapter 9 Problem 35(a,b,c,d,e)

11. For the target compound whose structure is shown below choose the multistep synthesis which could be used to prepare it from the given starting material.



__ A. First: Br_2/CH_2Cl_2; Next: excess $^-NH_2$; Next: 1. $^-NH_2$, and 2. CH_3CH_2Br; Finally: $Na/NH_3(liq)$

__ B. First: HBr/CH_2Cl_2; Next: Next: excess $^-NH_2$; Next: 1. $^-NH_2$, and 2. CH_3CH_2Br; Finally: H_2 and Pt/C

__ C. First: Br_2/CH_2Cl_2; Next: excess $^-NH_2$; Next: 1. $^-NH_2$, and 2. CH_3CH_2Br; Finally: H_2 and Lindlar catalyst

__ D. First: HBr/CH_2Cl_2; Next: excess $^-NH_2$; Next: 1. $^-NH_2$, and 2. CH_3CH_2Br; Finally: H_2 and Lindlar catalyst

__ E. First: Br_2/CH_2Cl_2; Next: excess $^-NH_2$; Next: 1. $^-NH_2$, and 2. CH_3CH_2Br; Finally: H_2 and Pt/C

Rationale:
Chapter 9 Problem 31d

12. Pick the **CORRECT** statement from the multiple choices.

__ A. CH_3OH is a better nucleophile than CH_3O^- in DMSO.

__ B. HO^- is a better nucleophile than H_2N^- in DMSO.

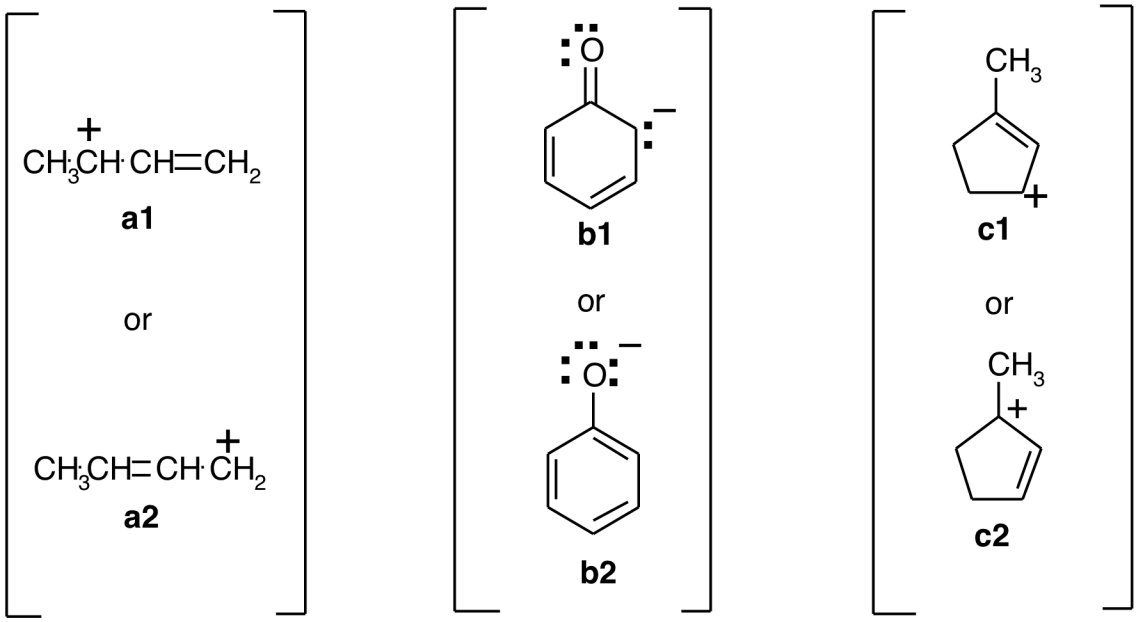
__ C. Cl^- is a better nucleophile than Br^- in H_2O.

__ D. Cl^- is a better nucleophile than Br^- in DMSO.

__ E. CH_3OH is a better nucleophile than CH_3O^- in H_2O.

Rationale:
Chapter 8 Problem 7

13. In **EACH** of the **PAIRS** of resonance structures shown below choose the structure which makes the **GREATER** contribution to the resonance hybrid. What are the structure labels of the structures you chose?



__ A. a2, b1, and c1

__ B. a1, b1, and c2

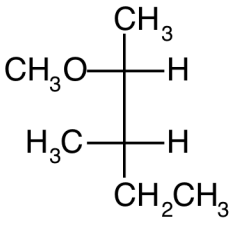
__ C. a1, b2, and c2

__ D. a1, b1, and c1

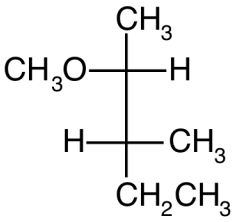
__ E. a1, b2, and c1

Rationale:
Chapter 7 Problm 50

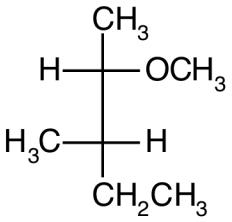
14. Find the substitution product(s) of the reaction of (2S,3R)-2-chloro-3-methylpentane + high concentration of CH_3O^- from among the numbered structures shown below. Choose the **CORRECT** statement from the multiple choices.



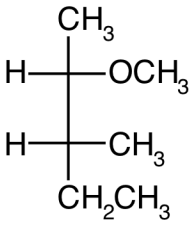
1



2



3



4

__ A. 2 and 4 are both products of this reaction.

__ B. 3 is the sole product of this reaction.

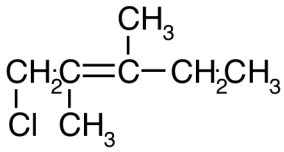
__ C. 4 is the sole product of this reaction.

__ D. 1 is the sole product of this reaction.

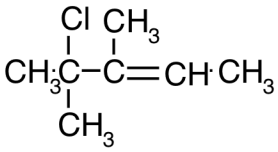
__ E. 2 is the sole product of this reaction.

Rationale:
Chapter 8 Problem 52b

15. Find the major products obtained from the reaction of one equivalent of HCl with 2,3-dimethyl-1,3-pentadiene from among the numbered structures below. Label the kinetic and thermodynamic product. Choose the **CORRECT** statement from the multiple choices.



1



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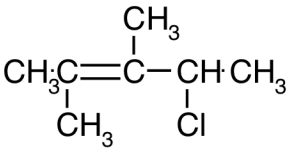
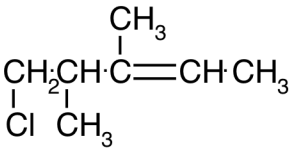


3



4

__ A. **4** is the kinetic product and **1** is the thermodynamic product.

__ B. **2** is the kinetic product and **3** is the thermodynamic product.

__ C. **3** is the kinetic product and **1** is the thermodynamic product.

__ D. **1** is the kinetic product and **4** is the thermodynamic product.

__ E. **3** is the kinetic product and **2** is the thermodynamic product.

Rationale:
Chapter 7 Problem 68a

Answer Key

"Grade or Education" = 1

CHEM 2261/01
Summer 12
Exam 3
Chapters 7-9

1. C
2. A
3. B
4. E
5. D
6. A
7. D
8. B
9. A
10. B
11. E
12. D
13. C
14. E
15. B