

淡江大學 95 學年度轉學生招生考試試題

系列：化學學系三年級

科目：有機化學

30-1 P. 1

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一. Multiple Choices: Choose the most appropriate answer for the following questions: (4 points each)

1. Which of the following correctly ranks the cycloalkanes in order of increasing ring strain per methylene?

- a. cyclopropane < cyclobutane < cyclohexane < cyclopentane
 b. cyclohexane < cyclopentane < cyclobutane < cyclopropane
 c. cyclohexane < cyclopentane < cyclopropane < cyclobutane
 d. cyclopentane < cyclopropane < cyclobutane < cyclohexane

2. Consider the isomeric alkanes shown, which of the following correctly lists these compounds in order of increasing boiling points?

- a. I < III < II b. III < II < I c. III < I < II d. II < III < I

- I: n-hexane
 II: 2,3-dimethylbutane
 III: 2-methylpentane

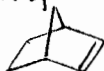
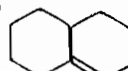
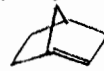

3. Which of the following is a primary alkyl halide?

- a. t-butyl chloride b. cyclohexyl bromide c. isobutyl bromide d. isopropyl bromide

4. Which of the following will undergo a S_N2 reaction most rapidly?

- a. $(CH_3)_2CHCH_2CH_2I$ b. $(CH_3)_2CHCH_2CH_2Cl$ c. $(CH_3)_3CCl$ d. $(CH_3)_3CCl$

5. Which of the following compounds violates the Bredt's rule?

- a.  b.  c.  d. 

6. Dehydrohalogenation of 2-bromobutane in the presence of a strong base proceeds via which of the following mechanistic pathway? a. S_N2 b. S_N1 c. E2 d. E1

7. Which of the following reagents should be used to convert 3-hexyne to (E)-3-hexene?

- a. $HgSO_4, H_2O$ b. Na, NH_3 c. H_2SO_4 d. H_2, Pt

8. When 2,2-dibromobutane is heated at $200^\circ C$ in the presence of molten KOH, what is the major product?

- a. 2-butyne b. 1-butyne c. 1-bromo-1-butyne d. 1-bromo-2-butyne

9. Which of the following cycloaddition is (are) photochemically allowed?

- a. [4+2] b. [2+2] c. [6+4] d. more than one of the above

10. What are the expected products of the reaction of PhOCH₃ with conc. HI?

- a. phenol and methanol b. iodobenzene and iodomethane
 c. iodobenzene and methanol d. phenol and iodomethane

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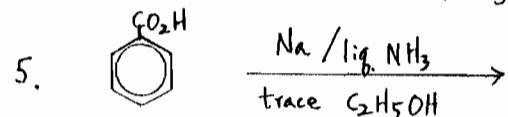
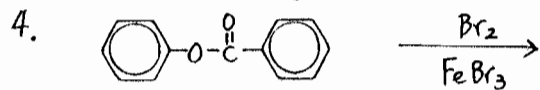
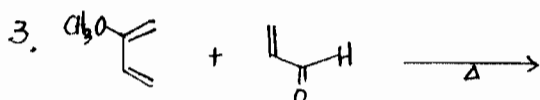
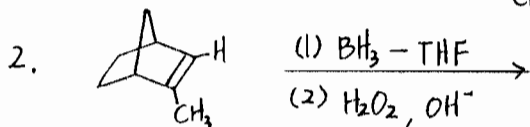
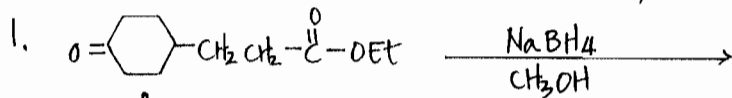
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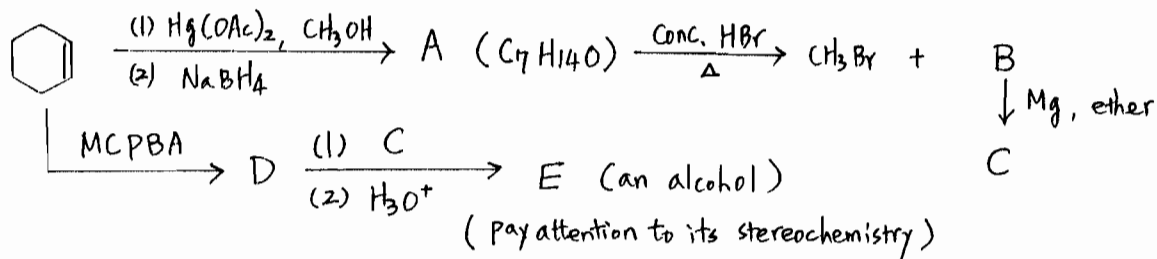
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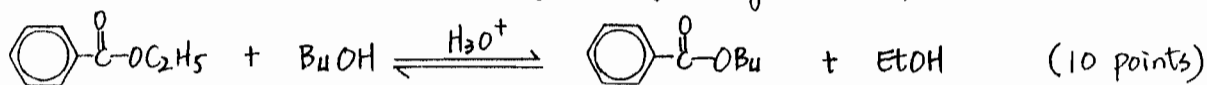
二. Predict the structures of the major organic products in the following reactions. (4 points each)
Pay attention to the stereochemistry of the products.



三. Give the structures of compounds A - E (20 points)



四. Give a detailed and stepwise mechanism for the following reaction:



五. Devise a synthetic scheme for the following conversion:

