

80-1

淡江大學 96 學年度碩士班招生考試試題

系別：化學工程與材料工程學系

科目：有機化學

准帶項目請打「V」

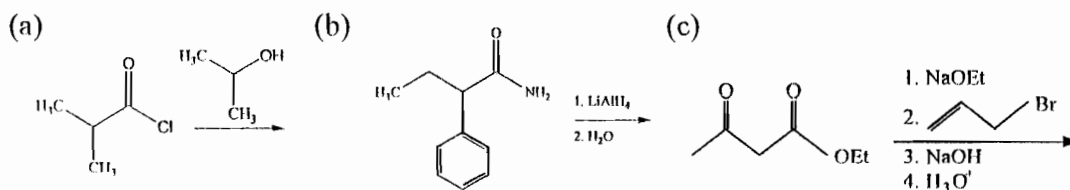
簡單型計算機

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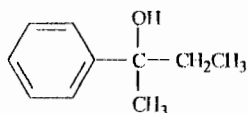
請依題號順序回答

1. (a) Give the names of three different types of secondary bonding? (6 points)
 (b) Which compound in each of the following pairs would have the higher boiling point?
 (1) ethyl alcohol or methyl ether (2) ethyl alcohol or ethylene glycol
 (3) heptane or pentane (4) propionic acid or methyl acetate (8 points)
2. Write down structural formulas for each of the following compounds: (8 points)
 (1) 2,3-Dichloropentane (2) trans-1-Isopropyl-3-methylcyclohexane
 (3) 2-ethyl-4,5-dimethyl-1-heptene (4) 1-methoxy-3-vinylcyclopentene

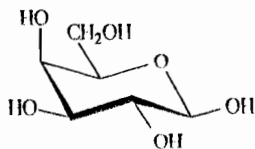
3. What is the major organic product produced by the following reaction? (9 points)



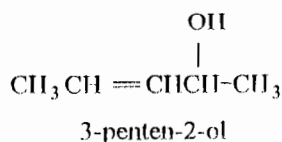
4. A useful and general method for the synthesis of alcohols is the addition of Grignard reagents to carbonyl compounds. Show what Grignard reagent and what carbonyl compound you would start with to prepare the following alcohol. List all possibilities. (9 points)



5. Draw structures for the products you would expect to obtain from reaction of the following compound β -D-galactopyranose with the listed reagents. Be sure to include all relevant stereochemistry. (a) CF_3I , Ag_2O (b) NaBH_4 in H_2O (c) Br_2 , H_2O (9 points)



6. Draw the monomers and the polymer of Nylon 4,6. (6 points)
 7. Draw all the stereoisomers of 3-penten-2-ol. (8 points)



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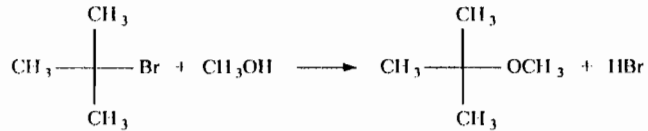
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簡單型計算機

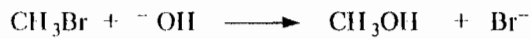
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8. Write a correct mechanism and specify the type of substitution reaction for each reaction below. (10 points)

(a)



(b)



9. When 2-bromopropane reacts with ethoxide ion, two products are formed; one is the product of $\text{S}_{\text{N}}2$ substitution and the other is the product of $\text{E}2$ elimination. Write the structures of both products, and tell how they could be distinguished using IR spectroscopy. (9 points)

10. Write down the reaction mechanism of free radical polymerization for styrene monomer initiated by benzoyl peroxide. (10 points)

11. Answer the questions below for the compound $\text{C}_4\text{H}_8\text{O}$, whose $^1\text{H-NMR}$ spectra is shown below. (a) Describe each signal in terms of its integration, splitting and chemical shift.

(b) Propose a structure for this compound.

(8 points)

