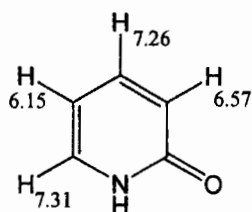


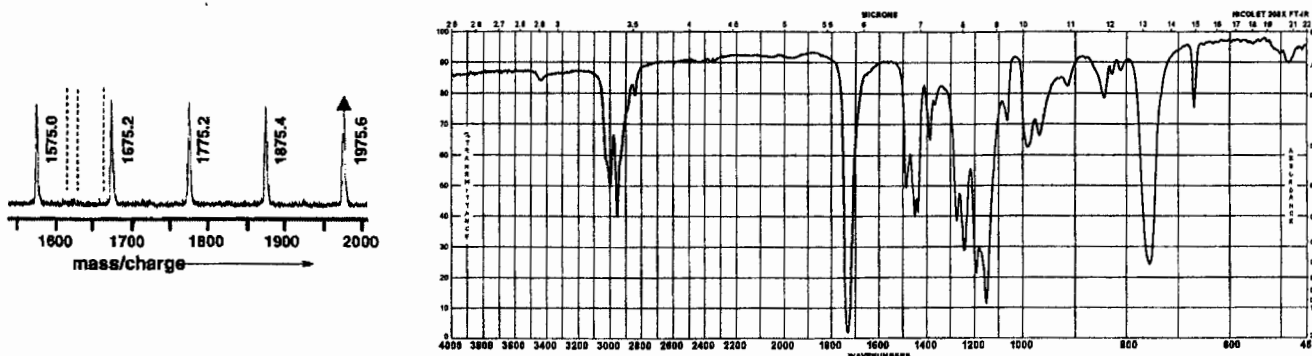
※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

Organic Chemistry (100 pts)

- (1) When (\pm)-2,3-dibromobutane reacts with potassium hydroxide, some of the product are (2*S*,3*R*)-3-bromo-2-butanol and its enantiomer and trans-2-bromo-2-butene. Give mechanisms to account for these products. (10 pts)
- (2) The proton NMR spectrum of 2-pyridone gives the chemical shifts shown. (10 pts)
- (a) Is 2-pyridone aromatic? Use resonance forms to explain your answer.
- (b) Explain why the protons at $\delta 7.31$ and $\delta 7.36$ are more deshielded than the other two ($\delta 6.15$ and $\delta 6.57$).



- (3) Depend on the reaction conditions, two different imines of formula C_8H_9N might be formed by the benzaldehyde with methylamine. Explain and give the structures of the two imines. (10 pts)
- (4) According to the following IR and MALDI mass spectra, please deduce the chemical structure of this polymer (an acrylate polymer from radical polymerization), and assign the absorbance band in the IR spectrum as detail as you can. (10 pts)



- (5) Show the first three steps (as far as the tetramer) in the BF_3 -catalyzed polymerization of propylene to polypropylene? (10 pts)

(背面仍有題目,請繼續作答)

系所組別：化學工程學系乙組

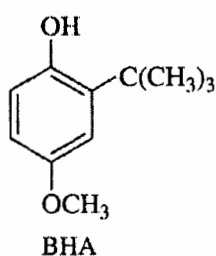
考試科目：有機化學

考試日期：0222，節次：1

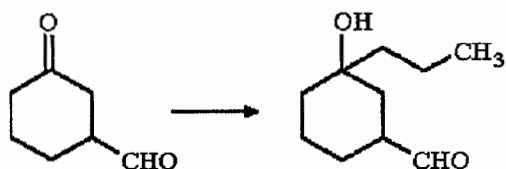
※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

(6) Draw the cyclic hemiacetal forms of D-mannose and D-galactose both as chair conformations and as Haworth projections. Mannose is the C2-epimer of glucose, and galactose is the C4-epimer of glucose. (10 pts)

(7) The antioxidant BHA is commonly used as a food preservative. Show how BHA can be made from phenol and hydroquinone. (10 pts)



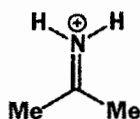
(8) Propose a sequence of steps to carry out the following conversion. (10 pts)



(9) Suggest a sequence of synthetic steps through which 2-phenylethanol can be prepared from toluene. One of your intermediates must be a carboxylic acid. (10 pts)

(10) Each of these electrophiles could react with a nucleophile (Nuc^-) at (at least) two different atoms. Identify these atoms and draw a mechanism for each reaction together with the products from each. (10 pts)

(a)



(b)

