國立中央大學八十四學年度碩士班研究生入學試題卷

所別: 生命科學研究所 組 科目: 有機化學 共 1 頁 第 1 頁

注意：務請依題目順序作答，否則扣分

1. Give structural formula for each of the following compounds: (14 pts)
   (a) D-Glucose (Fischer projection formula)
   (b) Pyridine
   (c) Cholesterol
   (d) Thiophenol
   (e) The most reactive phenyl Grignard reagent
   (f) The most stable *trans*-dimethylcyclohexane
   (g) The butanol ($C_4H_{10}O$) with the lowest boiling point

2. Define and give an example for each of the following: (36 pts)
   (a) Antioxidant
   (b) Tautomerism
   (c) *Trans*- (or *Anti*-)elimination
   (d) Monoterpenes
   (e) Nylon
   (f) Claisen condensation

3. Answer the following questions: (40 pts)
   (a) How would you explain the isomerization of methylenecyclohexane to 1-methylcyclohexene on the treatment of acid?
   (b) What is the mechanism of base-catalyzed aldol condensation?
   (c) How would you distinguish between ethyl benzoate and benzyl acetate by chemical or spectroscopic methods?
   (d) How would you make 3-chlorobenzoic acid from toluene?
   (e) Which one is more acidic, acetic or chloroacetic acd, and why?
   (f) Which one is more reactive toward cyanide ion, 1- or 2-bromobutane, and why?
   (g) What is the proper pH for the preparation of a hydrazone, and why?
   (h) Is triphenylamine a base in aqueous solution, and why?

4. Give brief explanation and specific examples to illustrate Markovnikov addition and anti-Markovnikov addition to alkenes. (10 pts)