

國立彰化師範大學 101 學年度碩士班招生考試試題

系所： 化學系

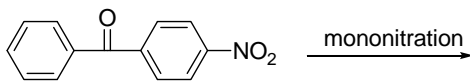
科目： 有機化學

☆☆請在答案卷上作答☆☆

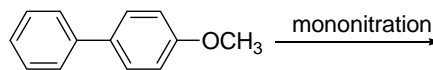
共 3 頁，第 1 頁

1. Please predict the product(s) for the following reactions. (18%)

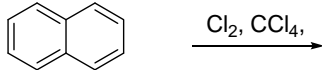
(1)



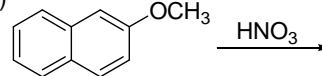
(2)



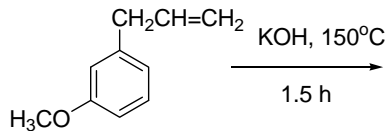
(3)



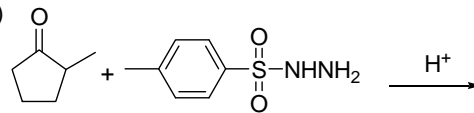
(4)



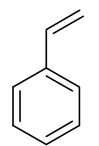
(5)



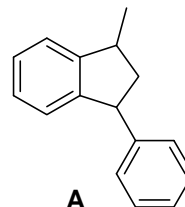
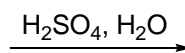
(6)



2. Polystyrene (polyethenylbenzene) is a familiar polymer used in the manufacture of foam cups and packing beads. One could, in principle, synthesize polystyrene by cationic polymerization with acid. However, this approach is unsuccessful because of the formation of dimer A. Please propose a mechanism for the formation of A. (8%)

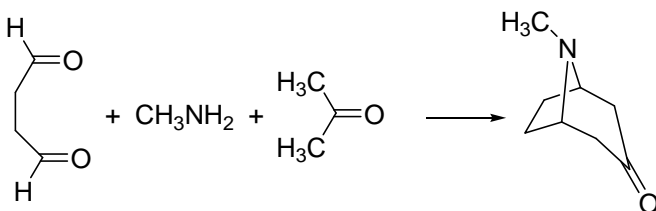


styrene



A

3. Tropinone was first synthesized by Sir Robert Robinson, in 1917, by the following reaction. Show a mechanism for this transformation. (8%)



國立彰化師範大學 101 學年度碩士班招生考試試題

系所： 化學系

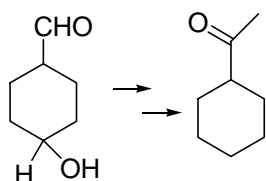
科目： 有機化學

☆☆請在答案卷上作答☆☆

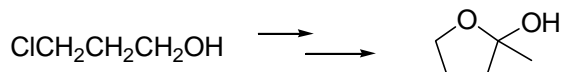
共 3 頁，第 2 頁

4. Propose efficient syntheses of each of the following molecules, beginning with the indicated starting materials. (16%)

(1)



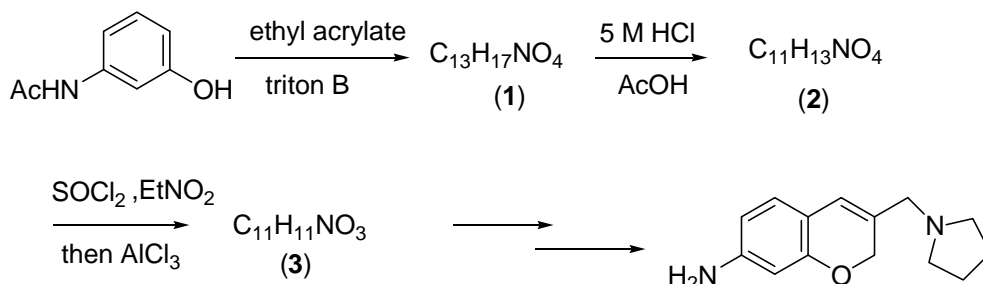
(2)



5. Illustrate the statement of the following terms using an example. (24%)

- (1) pericyclic reactions (2) S_N2' reactions (3) olefin metathesis (4) phosphorus ylids
 (5) enolate anions (6) isoquinolines (7) click chemistry (8) Evans auxiliaries

6. What are the intermediates (**1**, **2**, **3**) of the following transformations? (12%)



國立彰化師範大學 101 學年度碩士班招生考試試題

系所：化學系

科目：有機化學

☆☆請在答案卷上作答☆☆

共 3 頁，第 3 頁

7. What **the desired product** would be obtained from the reaction of the following procedure and data? (14%)

To a solution of 3-(3-bromophenyl) propanoic acid (1.603 g, 7.0 mmol) in methanol (20 mL) was added dropwise SOCl_2 (1.03 mL, 14.2 mmol) at 0 °C. The reaction was allowed to room temperature and stirred overnight. Concentration at reduced temperature and flash chromatography (20% ethyl acetate in hexanes) afforded 1.727 g (quantitative yield) of **the desired product**: $^1\text{H NMR}$ (300 MHz, CDCl_3) δ 7.35 (s, 1H), 7.34 (t, $J = 7.4$ Hz, 1H), 7.16 (d, $J = 7.4$ Hz, 2H), 3.68 (s, 3H), 2.92 (t, $J = 7.9$ Hz, 2H), 2.62 (t, $J = 7.9$ Hz, 2H).