

國立嘉義大學九十七學年度
生物醫藥科學研究所碩士班（甲組）招生考試試題

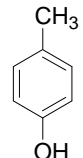
科目：有機化學

1. Write the expected major products that should form with the addition to 4-methoxytoluene of each of the following reagent mixtures. (10%, 2% each)

- (A) $\text{CH}_3\text{COCl} + \text{AlCl}_3$
 (B) $\text{SO}_3 + \text{H}_2\text{SO}_4$
 (C) $(\text{CH}_3)_2\text{C}=\text{CH}_2 + \text{AlCl}_3$
 (D) $\text{Cl}_2 + \text{AlCl}_3$
 (E) $\text{HNO}_3 + \text{H}_2\text{SO}_4$

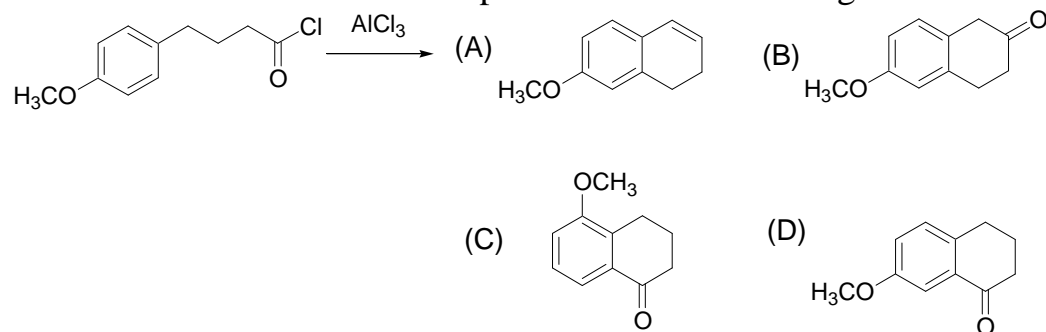
2. Select the best answer for the following questions. (20%, 4% each)

(1) What is the correct name of the following compound?

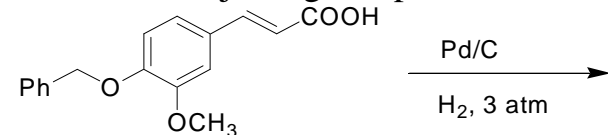


- (A) Methyl benzyl ether (C) Anisole
 (B) 4-Methoxybenzene (D) 4-Methylphenol

(2) Which would be the structure of the product for the following Friedel-Crafts reaction?



(3) What is the major organic product from this sequence of reaction?



- (A) (B)
 (C) (D)

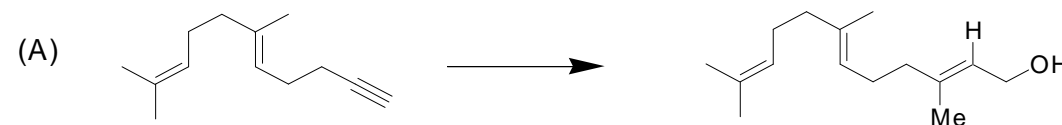
(4) Which of the following compound has a sharp IR absorption at 1710 cm^{-1} ?

- (A) $\text{CH}_3\text{COOCH}_3$ (B) $\text{CH}_3\text{CH}_2\text{OH}$
 (C) $\text{CH}_3\text{CH}_2\text{OCH}_3$ (D) *trans*- $\text{CH}_3\text{CH}=\text{CHCH}_3$

(5) What would be the major product from the addition of cyclohexene with Br_2/CCl_4 ?

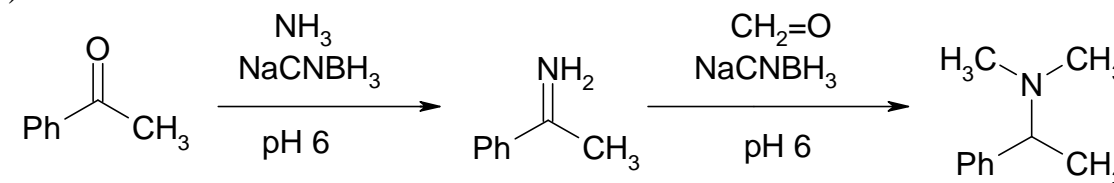
- (A) *trans*-1,2-dibromocyclohexene (B) *trans*-1,3-dibromocyclohexene
 (C) *cis*-1,2-dibromocyclohexene (D) *cis*-1,4-dibromocyclohexene

3. Supply the reagents required to accomplish each of the following synthesis. Show the structures of the intermediates obtained after each step and their relative stereochemistry where applicable. (20%, 10% each)

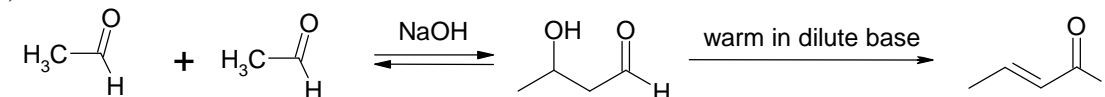


4. Draw mechanisms for the following reactions. (20%, 10% each)

(1)



(2)



5. Explain the following terms and give examples. (10%, 5% each)

- (1) meso compound (5%)
 (2) diastereomer (5%)

6. Propose a structural formula for each compound. (20%, 10% each)

(1) $\text{C}_5\text{H}_{10}\text{O}_2$

$^1\text{H-NMR}$ δ : 0.94 (t, 3H), 1.39 (m, 2H), 1.62 (m, 2H), 2.35 (t, 2H), 12.00 (s, 1H).
 $^{13}\text{C-NMR}$ δ : 13.69, 22.21, 26.76, 33.89, 180.7.

(2) $\text{C}_7\text{H}_{14}\text{O}_2$

$^1\text{H-NMR}$ δ : 0.92 (d, 6H), 1.52 (m, 2H), 1.70 (m, 1H), 2.09 (s, 3H), 4.10 (t, 2H).
 $^{13}\text{C-NMR}$ δ : 21.06, 22.45, 25.05, 37.31, 63.12, 171.15.