

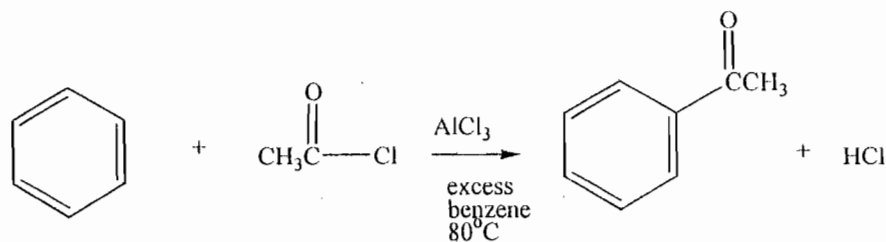
系別：化學工程與材料工程學系

科目：有機化學

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依照題目順序作答。

1. Although acetic acid and carboxylic acids containing fewer than five carbon atoms are soluble in water, many other carboxylic acids of higher molecular weight are not appreciably soluble in water. Because of their acidity, however, water-insoluble acids dissolve in aqueous sodium hydroxide; they do so by reacting to form water-soluble sodium salts. Explain the meaning of the previous description and give an example with a stoichiometric equation of reaction. (10%)
2. The reaction between a carboxylic acid and an alcohol gives an ester. The reaction, called esterification, is usually catalyzed by free proton. Give the reaction mechanism for acid-catalyzed esterification, and also specify the transition states (i.e. intermediate species) in the reaction mechanism and the rate-determining step. (10%)
3. Describe the epoxide ring opening mechanisms by acid-catalyzed reaction and base-catalyzed one. (10%)
4. The following reaction is called Friedel-Crafts Acylation. Give the reaction mechanism for it. (10%)



5. What is a nucleophile? And gives 3 examples of reaction as nucleophilic substitution. (10%)

◀ 注意背面尚有試題 ▶

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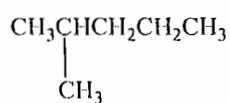
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6. Describe the reaction mechanism of free radical chain polymerization. (20%)

7. Draw the structure formula for each of the following compounds. (30%)

For example: isohexane,



1. 2,3-Dichlorobutane
2. Diethyl ether
3. Acetonitrile
4. 2-Propen-1-ol
5. 3-Ethoxy-1-butene
6. trans-1,2-Cyclopentanediol
7. m-Chloronitrobenzene
8. Terephthalic acid
9. Pyrrole
10. Lysine