CHAPTER OVERVIEW

21: CARBOXYLIC ACIDS

LEARNING OBJECTIVES

After reading this chapter and completing ALL the exercises, a student can be able to

- describe the structure and physical properties of carboxylic acids and carboxylate salts (section 21.1)
- explain and predict the relative acidity of carboxylic acids using resonance, hybridization, and substituent effects (section 21.2)
- determine the structure of carboxylic acids from their elemental analysis and spectral data (MS, IR ^{1}H NMR & ^{13}C NMR) (section 21.3)
- predict the products and specify the reagents to synthesize carboxylic acids (section 21.4)
- recognize and classify the major reactions of carboxylic acids (section 21.5)
- show the general mechanism for Nucleophilic Acyl Substitution Reactions (section 21.5)
- predict the products and specify the reagents for reactions of carboxylic acids with
  - sulfonyl chlorides (section 21.5)
  - alcohols (section 21.6)
  - diazomethane (section 21.7)
  - amines (section 21.8)
  - reducing agents (section 21.9)
- combine the reactions studied to date to develop efficient and effective multiple-step synthesis

Please note: IUPAC nomenclature and important common names of carboxylic acids were explained in Chapter 3.

It can useful is often required to memorize the structures for the following common names: formic acid, acetic acid, acetyl chloride, acetic anhydride, acetic formic anhydride, ethyl acetate, sodium and potassium salts of formate, acetate, and benzoate, acetamide, benzamide, acetonitrile, benzonitrile, carbonic acid, oxalic acid, malonic acid, succinic acid, glutaric acid, adipic acid, and phthalic acid

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