

CHAPTER 13

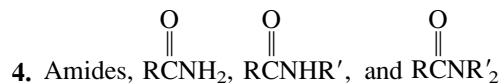
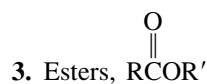
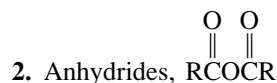
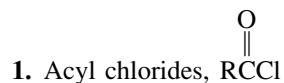
CARBOXYLIC ACID DERIVATIVES

The previous two chapters described three classes of organic compounds characterized by the presence of a carbonyl (>C=O) group: aldehydes, ketones, and carboxylic acids. We will now expand our discussion to include the principal classes of carboxylic acid derivatives. Two of these, **esters** and **amides**, are especially important in both organic and biochemistry and will receive particular emphasis.

13.1 NOMENCLATURE OF CARBOXYLIC ACID DERIVATIVES

Each of the **carboxylic acid derivatives** we will encounter possesses an **acyl group**,

RC(=O)- or ArC(=O)- attached to a halogen, oxygen, or nitrogen atom. The four classes of carboxylic acid derivatives are



CHAPTER OUTLINE

- 13.1 Nomenclature of Carboxylic Acid Derivatives
- 13.2 Structure of Carboxylic Acid Derivatives
- 13.3 Nucleophilic Acyl Substitution: Hydrolysis
- 13.4 Natural Sources of Esters
Biological Acyl Transfer
- 13.5 Preparation of Esters: Fischer Esterification
- 13.6 Preparation of Esters: Additional Methods
- 13.7 Reactions of Esters: Hydrolysis
An Ester of an Inorganic Acid: Nitroglycerin
- 13.8 Preparation of Tertiary Alcohols from Esters and Grignard Reagents
- 13.9 Reduction of Esters
- 13.10 Naturally Occurring Amides
- 13.11 Preparation of Amides
- 13.12 Hydrolysis of Amides
Condensation Polymers: Polyamides and Polyesters
Learning Objectives
- 13.13 Summary
Additional Problems