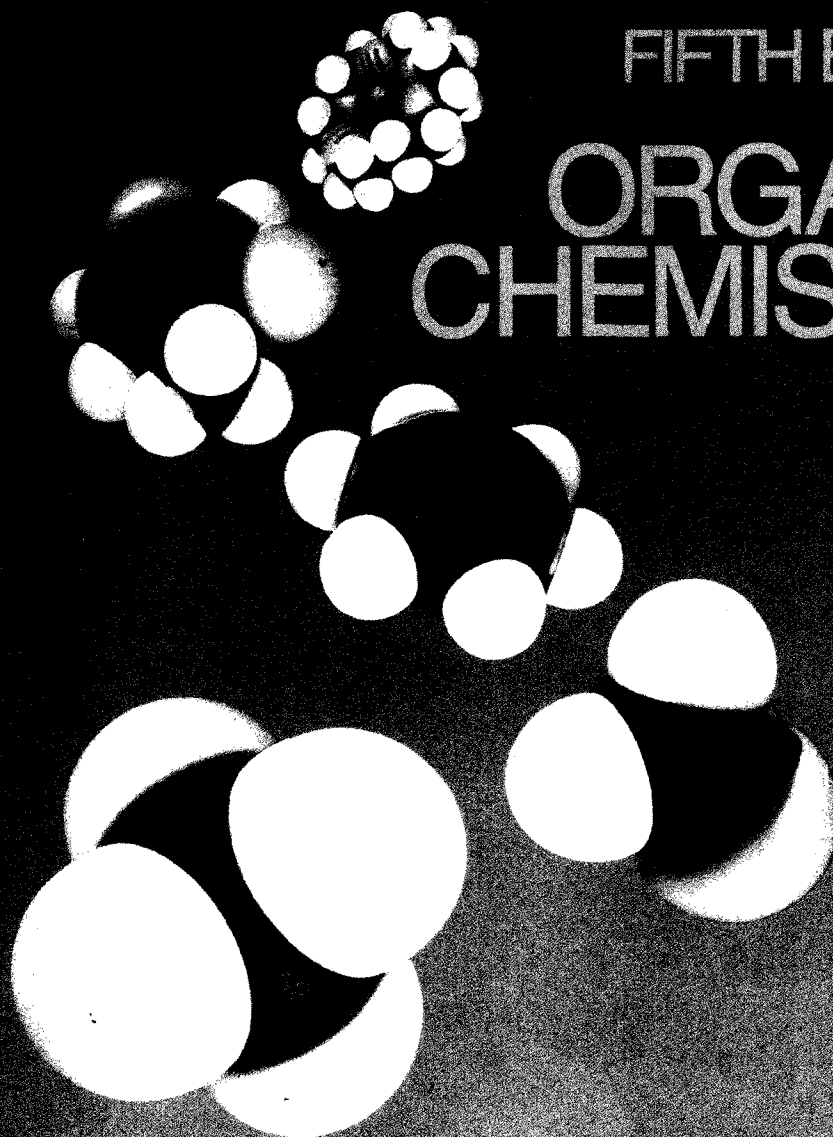


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Fifth Edition

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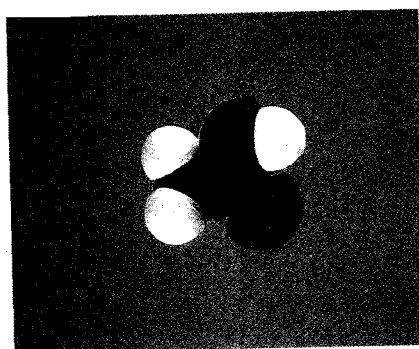
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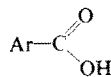
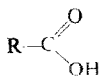
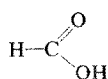
23

Carboxylic Acids



23.1 Structure

Of the organic compounds that show appreciable acidity, by far the most important are the carboxylic acids. These compounds contain the **carboxyl group**



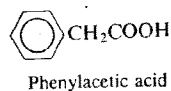
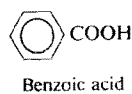
attached to hydrogen (HCOOH), an alkyl group (RCOOH), or an aryl group (ArCOOH). (See Fig. 23.1, p. 818.) For example:

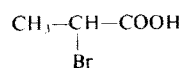
HCOOH
Formic acid
Methanoic acid

CH₃COOH
Acetic acid
Ethanoic acid

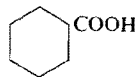
CH₃(CH₂)₁₀COOH
Lauric acid
Dodecanoic acid

CH₃(CH₂)₇CH=CH(CH₂)₇COOH
Oleic acid
cis-9-Octadecenoic acid





α -Bromopropionic acid
2-Bromopropanoic acid



Cyclohexanecarboxylic acid



Acrylic acid
Propenoic acid

Whether the group is aliphatic or aromatic, saturated or unsaturated, substituted or unsubstituted, the properties of the carboxyl group are essentially the same.

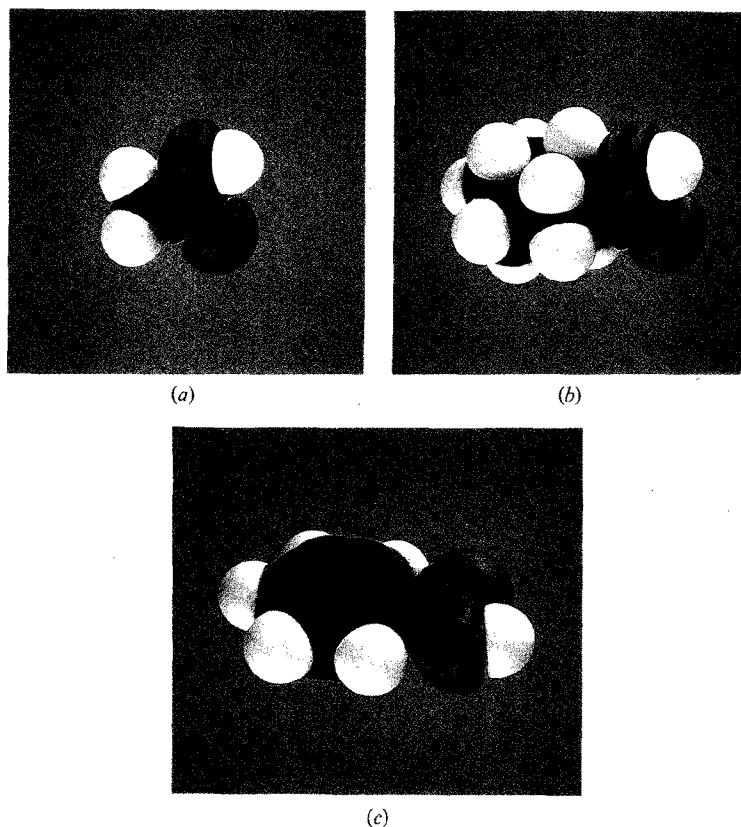


Figure 23.1 Models of some carboxylic acids: (a) acetic acid, CH_3COOH ; (b) cyclohexanecarboxylic acid, *cyclo*- $\text{C}_6\text{H}_{11}\text{COOH}$; (c) benzoic acid, $\text{C}_6\text{H}_5\text{COOH}$.

23.2 Nomenclature

The aliphatic carboxylic acids have been known for a long time, and as a result have common names that refer to their sources rather than to their chemical structures. The **common names** of the more important acids are shown in Table 23.1. *Formic acid*, for example, adds the sting to the bite of an ant (Latin: *formica*,

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