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seventh edition

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ORGANIC CHEMISTRY

seventh edition

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*For Judith, Allen, Graham, Jennie, Guido, and Cory. TWGS
For Deanna, Lauren, and Heather. CBF*

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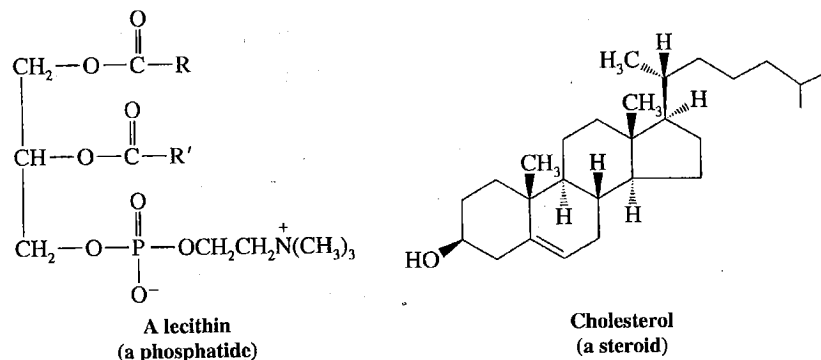
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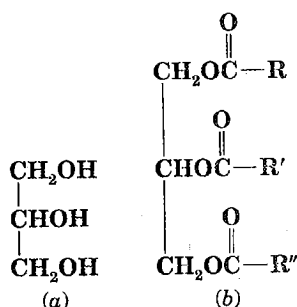
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23.2 FATTY ACIDS AND TRIACYLGLYCEROLS

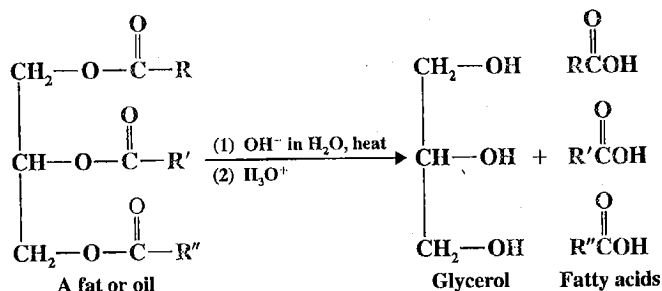
Only a small portion of the total lipid fraction obtained by extraction with a nonpolar solvent consists of long-chain carboxylic acids. Most of the carboxylic acids of biological origin are found as *esters of glycerol*, that is, as **triacylglycerols** (Fig. 23.1).*

Figure 23.1 (a) Glycerol. (b) A triacylglycerol. The groups R, R', and R'' are usually long-chain alkyl groups. R, R', and R'' may also contain one or more carbon-carbon double bonds. In a triacylglycerol R, R', and R'' may all be different.



Triacylglycerols are the oils of plants and the fats of animal origin. They include such common substances as peanut oil, soybean oil, corn oil, sunflower oil, butter, lard, and tallow. Triacylglycerols that are liquids at room temperature are generally called **oils**; those that are solids are called **fats**. Triacylglycerols can be **simple triacylglycerols** in which all three acyl groups are the same. More commonly, however, the triacylglycerol is a **mixed triacylglycerol** in which the acyl groups are different.

Hydrolysis of a fat or oil produces a mixture of fatty acids:



* In the older literature triacylglycerols were referred to as triglycerides, or simply as glycerides. In IUPAC nomenclature, because they are esters of glycerol, they should be named as glyceryl trialkanoates, glyceryl trialkenoates, and so on.