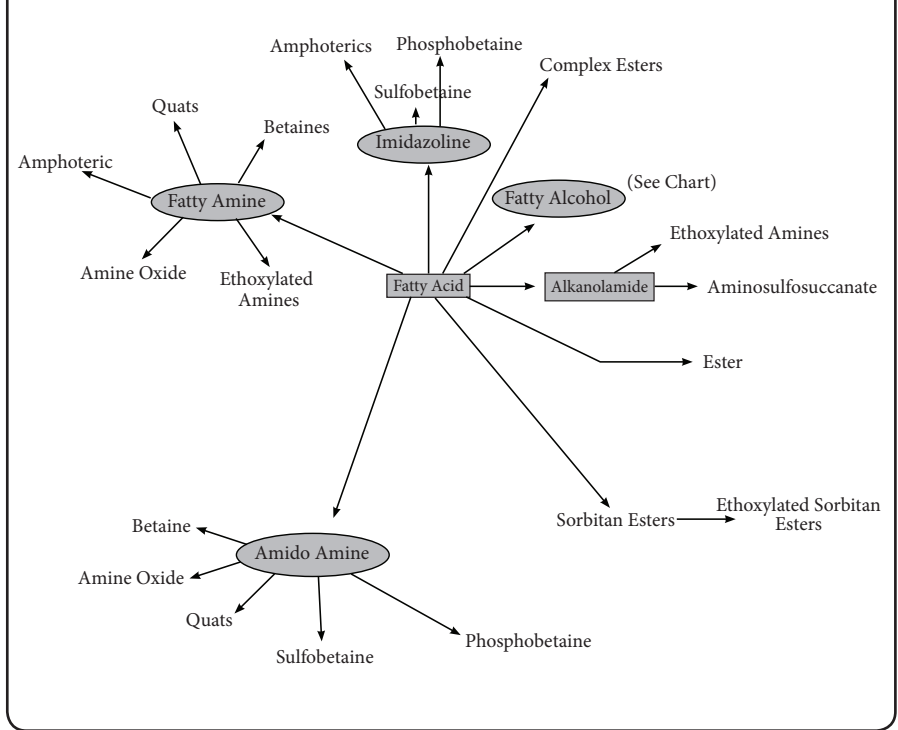
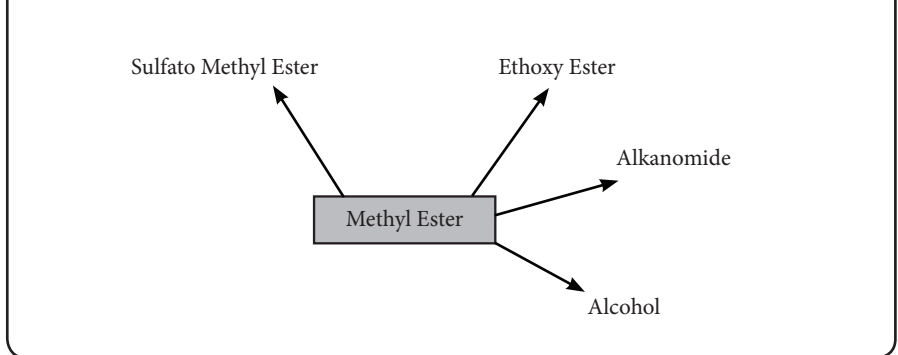


**Figure 2.3. Acid Reactions**



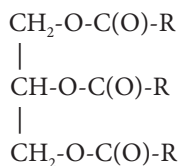
**Figure 2.4. Methyl Ester Reactions**



## 1) Triglycerides

Triglycerides are key raw materials; when a triglyceride is reacted to introduce a water-soluble group, a surfactant results.

The triglycerides used in the preparation of surfactants are the naturally occurring tri-esters of glycerin. Their structure is as follows:



### Classification

Triglycerides can be divided into three classes. These classes are:

- Class I: products rich in components below C18.
- Class II: products rich in C18 unsaturated components.
- Class III: products rich in components with chain lengths higher than C18.

**Table 2.2** shows the names of the fatty acids; these designations work as well as the empirical formulas.

Designation	Name	Formula
C6	Caproic acid	C <sub>6</sub> H <sub>12</sub> O <sub>2</sub>
C8	Caprylic acid	C <sub>8</sub> H <sub>16</sub> O <sub>2</sub>
C10	Capric acid	C <sub>10</sub> H <sub>20</sub> O <sub>2</sub>
C12	Lauric acid	C <sub>12</sub> H <sub>24</sub> O <sub>2</sub>
C12:1	Lauroleic acid	C <sub>12</sub> H <sub>22</sub> O <sub>2</sub>
C14	Myristic acid	C <sub>14</sub> H <sub>28</sub> O <sub>2</sub>
C14:1	Myristoleic acid	C <sub>14</sub> H <sub>26</sub> O <sub>2</sub>
C16	Palmitic acid	C <sub>16</sub> H <sub>32</sub> O <sub>2</sub>
C16:1	Palmitoleic acid	C <sub>16</sub> H <sub>30</sub> O <sub>2</sub>
C18	Stearic acid	C <sub>18</sub> H <sub>36</sub> O <sub>2</sub>
C18:1	Oleic acid	C <sub>18</sub> H <sub>34</sub> O <sub>2</sub>
C18:2	Linoleic acid	C <sub>18</sub> H <sub>32</sub> O <sub>2</sub>
C18:3	Linolenic acid	C <sub>18</sub> H <sub>30</sub> O <sub>2</sub>
C20	Arachidic acid	C <sub>20</sub> H <sub>40</sub> O <sub>2</sub>
C20:1	Gadoleic acid	C <sub>20</sub> H <sub>38</sub> O <sub>2</sub>

**Table 2.2 cont.**  
**Fatty Acid Nomenclature**

Designation	Name	Formula
C22	Behenic acid	$C_{22}H_{44}O_2$
C22:1	Erucic acid	$C_{22}H_{42}O_2$
C22:2	Clupanodinic acid	$C_{22}H_{40}O_2$
C24	Lignoceric acid	$C_{24}H_{48}O_2$
C26	Cerotic acid	$C_{26}H_{52}O_2$
C28	Montanic acid	$C_{28}H_{56}O_2$
C30	Myricic acid	$C_{30}H_{60}O_2$
C32	Lacceroic acid	$C_{32}H_{64}O_2$
C34	Geddic acid	$C_{34}H_{68}O_2$

### A. Class I: Products rich in components below C18

#### 1. Coconut oil (*cocos nucifera*)

##### a. Source

Coconut oil is the most abundant processed natural oil. Coconut oil comes from seeds of the *cocos nucifera* plant. It is the most common oil raw material used in the cosmetic industry. Coconut oil is cultivated principally in Southeast Asia and the Philippines. It is the major source of lauric acid (C12).

##### b. Chain Distribution

Component	Typical % by Weight
C8	8
C10	7
C12	48
C14	19
C16	8
C18	3
C18:1	5
C18:2	2

CAS Number: 8001-31-8  
Iodine Value: 8

EINECS Number: 232-282-8  
Titer Point: 22°C (free fatty acids)