Chapter 1

Acetoglycerides

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Acetoglycerides are made by converting natural or synthetic glycerides to a mono- or diacetate by replacing a like number of fatty acid molecules in the glyceride. They occur as alpha, alpha-beta, alpha-alpha, and beta types of glycerides under normal methods of manufacture; the result is usually mixtures of these types.

Two convenient methods are available for making acetoglycerides. In one, triacetin is interesterified with a fat or oil with or without added glycerol. (Eastman Kodak Co. 1959) In the second method, a glycerol-free monoglyceride is directly acetylated.

Mixed products result from these reactions. Their properties are controlled by the selection of starting material and the degree of acetylation. Feuge (1955) has compiled an excellent review of production methods for acetoglycerides. It discusses means and effects of varying both physical and chemical properties.

The acetoglycerides have unusual crystal habits. This accounts for their valuable properties. A sample of the outstanding property of acetoglycerides is their lack of greasy feel.

The plastic range for acetoglycerides, or of mixtures containing significant amounts of acetoglyceride, is greatly improved. This is due to both size and shape of the crystals. Mixtures of acetoglycerides, those containing acetylated glycol stearate, are used chiefly as an emulsion stabilizer and skin conditioner. Acetylated hydrogenated cottonseed glyceride is a skin conditioner and occlusive. The same properties make acetylated palm kernel, hydrogenated lard, and hydrogenated tallow glycerides; acetylated vegetable and lard glyceride; and acetylated sucrose distearate suitable for use as emollients and skin conditioning agents.

Cosmetic Uses

Wherever stick products with resistance to fracture are wanted, acetoglycerides will find an application. If a special consistency is to be maintained, try an acetoglyceride.

Because acetoglycerides are easily adapted to either solid or liquid emulsions and are largely alcohol-soluble, their range of usefulness runs from hair and scalp lotions, sunscreen products and pre- and after-shave lotions to applications in lipsticks for producing sticks with good resistance to breakage. The application of such products on the lips is also said to "feather" less than conventional products.

The amount of acetoglyceride needed for any special application varies from a few percent to 100% (when used in any formulation), depending on the material used and the results desired.

Acetylation of oil raises both the cloud point and the solidification point from that of the original oil. The plasticity range of the resultant product is also greater than that of the starting material.

Acetylation of solid fats results in products with the properties of acetostearins. Thus, tristearin, on "rapid cooling solidifies in the alpha polymorphic form and then readily reverts to the thermodynamically stable beta form, when kept at a temperature just below" the melting point. In both forms, tristearin is a brittle, opaque and hard solid. However, "ordinary cooling of melted 1,2-diaceto-3-stearin … produces the alpha form which is quite stable; and most important is extremely waxy." (Feuge 1955)

The rate at which acetoglycerides hydrolyze in contact with water is no greater than of natural glycerides. Acidity increases, as with natural oils, but no odor of acetic acid is detectable.

References

Eastman Kodak Co. 1959. British Patent No. 822,730.
Feuge, R. O. 1955. *Food Technol.* 9: 314.