ABSTRACTS

Soaps

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Rancidity in soaps. *The American Perfumer and Essential Oil Review,* 29, 6, 298 (1934).—The unpleasant odor associated with rancidity is due to the oxidation of fatty acids with formation of aldehydes and polybasic acids, and the actual substance which causes the smell is probably a heptyl- or similar aldehyde.

The so-called Kreis reaction which used to be employed for detecting or confirming rancidity is really due to another aldehyde (epihydrinaldehyde), and this particular aldehyde does not cause the characteristic rancid smell.

In any case the constitution of the fat used, its content of unsaturated acids, and the precise nature of molecular weight of these acids are of considerable importance, and the fats commonly used in soapmaking may be graded according to their disposition to cause rancidity in soaps, the unsaturated fatty acids being the most liable. The presence of hydroxyl groups in a fat or fatty acid appears to act as a deterrent to rancidity. In grading fats in this way tallow and hardened fats are held to be the least liable to deterioration when saponified, then olive oil and its group come next, and last of all, as the most liable to rancidity, are the coconut oil class and resins.

Traces of metal may get into a fat in a variety of ways, e. g., by simple contamination with the iron or other metallic vessels in which they are treated, by impurities in the materials used, or by incomplete removal of catalyst from hardened fats. Metals like fats may also be graded in order of efficiency as rancidity agents, as follows: copper, cobalt, iron, nickel, manganese, mercury, lead, tin. A common occurrence is for a trace of iron to be present and this may combine with the hyposulfite used in bleaching, and give rise to dark specks or stains on the soap.

Considerable importance is now attached to the presence of a little free alkali in a soap as a preventive of rancidity. The free alkali probably acts by preventing hydrolytic splitting of the soap; it also saponifies any free fatty acid that may be present, but in view of the small amount of free alkali that could reasonably be allowed it would hardly seem to be sufficient to deal with more than an extremely low percentage of free acid. And, on the other hand, if too much free alkali is present. this in itself may be a predisposing cause of rancidity, or at least of sweating which may or may not accompany any true rancidity. The excess of free alkali upsets the equilibrium of the colloidal system constituting the soap, leading to setting free of water which finds its way to the surface, carrying with it in solution or suspension some fat or fatty acid, tending to form a sweat on the surface of the soap.

Soaps from Palm Kernel Oil. *Oil and Colour Trades Journal,* LXXXVI, 1872, 571 (1934).—The main difficulties with palm kernel oil in soap manufacture, and particularly curd soap, are that rancidity soon sets in and the soap has a tendency to become somewhat brittle. A writer in *"Seifen. Zeit.,"* 1934, p. 382, overcomes these difficulties by using a particular blend of oils and separate saponification. The blend used is: palm kernel oil 75 percent, groundnut oil 20 percent, and soya bean oil 5 percent. The palm kernel oil is saponified separately from the other two, both batches salted out and then crutched in together. A yellow-colored soap of good keeping qualities is said to be produced.

Esterification of fatty acids. *Oil and Colour Trades Journal,* LXXXVI, 1872, 571 (1934).—The synthesis of fats from fatty acids and glycerin, says E. Vasallo (*"Olii e Grassi,"* p. 10, 1934) can be looked upon as an accomplished fact, and it is of interest to consider the use of monovalent alcohols in order to obtain valuable fatty acid esters by similar methods. Haller observed that when a fat is treated at the boil with HCl saturated alcohol, the glycerin is substituted by the ethyl alcohol. By this alcoholysis pure glycerine is split off. On the other hand, it is possible to saturate the free fatty acids of a fat. The present author found that it was possible by esterification with ethyl alcohol to reduce the free fatty acid content in a fat to 8 percent. No further realization takes place below this. The crude ethyl ester is dark brown, and may be purified to a yellow product containing 2 percent free fatty acid by distilling in vacuo at 180-200° C. Esterification proceeds within four hours at a temperature of 86-87° C. The esterified product is washed with salt solution. As the dark color of the esters was assumed to be due to the acid used, the author attempted to reduce the color by using oxalic acid or ferric chloride. Esterification proceeded in both cases, but the color was still dark. The esters purified by treatment with 2 percent sulphuric acid were tested in a burning test. The lamp fed by the esters burned quietly for ten hours, without smoke and with normal clarity. Probably the esters would make good lubricants.

Sodium metaphosphate in mechanical dishwashing. Charles Schwartz and Bernard H. Gilmore, Mellon Institute of Industrial Research, Pittsburgh, Pennsylvania.—The precipitation factor is an important phase of detergent processes. Available water supplies usually contain appreciable quantities of calcium and magnesium salts which have the property of forming insoluble and adherent precipitates of calcium and magnesium compounds from the alkaline salts added as detergents and the soaps resulting from the interaction of an alkaline detergent with fatty soil. It has been shown that sodium hexametaphosphate has the property of sequestering calcium and magnesium ions by the formation of soluble complex molecules in which the concentration of calcium and magnesium ions is considerably diminished. The addition of sodium hexametaphosphate to dishwashing compounds prevents film formation. permits the full value of the detergent mixture to be obtained. and yields results that are superior with respect to brightness and freedom from film. (*Chemical and Metallurgical Engineering,* 26, 9, 998 (1934).)

PATENTS

Improved process for manufacturing fatty esters. British Patent Specification Number 412,766 (complete accepted: July 5, 1934) is in the name of The Procter & Gamble Company, Ivorydale, Ohio.

The object of the invention is to provide an improved process for carrying out the reaction of glycerine and also other polyhydric alcohols with fats and fatty oils. The process has the advantage of great speed of reaction in the higher range of temperatures heretofore usually employed for combining glycerin with fats, and also the advantage of affording a convenient and economical means for carrying out this and similar reactions at lower temperatures, for example, at temperatures in the range 170° C. to 205° C.

In accordance with the invention the fatty esters containing unesterified hydroxyl groups are prepared by effecting the reaction of triglycerine in a fat or fatty oil with a polyhydric alcohol in the presence of a catalyst comprising a small amount of a soap of a metal of valence not greater than two.

Excellent results are obtained at temperatures in the range 170° C. to 205° C. Higher temperatures may be used but are unnecessary. For satisfactory operation at about 150° C. or lower, reference should be made to special improvements described in the copending application No. 16,876/33.

For making products such as monoglyceride, containing a maximum of combined polyhydric alcohol, the inventors use as catalyst preferably 1 percent to 5 percent by weight of sodium soap based on the total fat, or an equivalent amount of caustic alkali, but higher amounts of the catalyst give even faster reaction, and some advantage can be realized by the use of even less than 1 percent soap or equivalent alkali. When the amount of polyhydric alcohol to be combined with fat is less than the maximum, the amount of catalyst used may be decreased in about the same proportion.

Example I.—100 parts by weight of coconut oil. and equal weight of glycerin, and 2 parts by weight of a commercially pure sodium soap were mechanically agitated at 200° C. for two hours. After withdrawing the residual layer of glycerin and washing with water to remove most of the dissolved glycerin from the fatty layer, the latter had a saponification value of approximately 197, almost the theoretical value for monoglyceride of coconut oil fatty acids. (*Perfumery Essential Oil Record,* 25, 8, 262 (1934).)

Apparatus and method for distilling higher fatty acids, e. g., oleic, stearic, from stock containing them, e. g., palm oil or greases split by the Twitchell process. New Process Fat Refining Corporation. British 408, 117, April 5, 1934. (*C. A.* 28, 16, 5270 (1934).)

Apparatus and method for distilling fatty acids. New Process Fat Refining Corporation. British 406, 184, February 22, 1934. (*C. A.* 28, 15, 4928 (1934).)

Multi-ply paper containing glycerol. George A. Richter (to Brown Company). U. S. 1,964,793, July 3, 1934.—A paper which is suitable for writing, printing, etc., is formed with at least 3 plies, the internal ply being glycerinated and the outer plies being substantially free from glycerol. Apparatus is described. (*C. A.* 28, 16, 5240 (1934).)