an inventoried glycerol recovery well over 85 per cent.

The formula below will give the percentage of recovery in the range of 80-95 per cent with fairly accurate results on a countercurrent, three-wash kettle plan in which the new stock is about 95 per cent saponified in the first change.

This formula may be used to estimate the recovery on a given kettle or it may be used in setting up a kettle plan with the purpose of achieving a definite recovery.

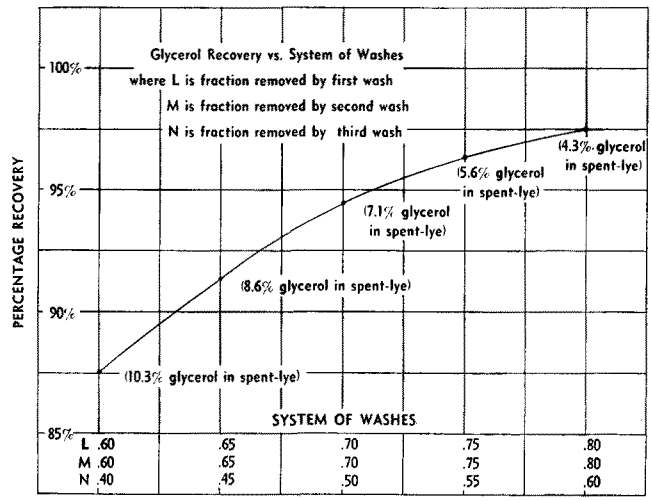
Summary

A kettle plan has been worked out which in actual practice yields a well-cleansed neat soap, with ample production, and with a predictable high recovery of glycerin.

A formula has been set up which in the hands of a chemical engineer will enable him to recover the highest practicable yield of glycerin.

Acknowledgment

The author wishes to thank Eugene Hamry, chief soapmaker, for his cooperation. Without his skillful, intelligent craftsmanship this work would have been much more difficult.



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(1) Wigner, J. H., Soap Manufacture, Page 116, Chemical Publishing Co., 1940.

(2) Ferguson, R. H., Oil and Soap, Vol. XIV, No. 5.

(3) Wigner, J. H., Soap Manufacture, Page 56, Chemical Publishing Co., 1940.

$$\%\ \text{Recovery} = 100L\left[(.950+A)+\frac{(1.000+A)M-(.950+A)LM+\dfrac{(MN)(1-M)(1+A-.950L-LA)}{(1-N+MN)(1-M+ML)}}{(1-M+LM)}\right]$$

where "L" is the ratio of wash to total aqueous content of kettle on the first change
"M" is the ratio on the second change
"N" is the ratio on the third change
"A" is an element the value of which varies according to the system of washes used.

System	*Value of "A"*
.60-.60-.40	.060
.65-.65-.45	.043
.70-.70-.50	.026
.75-.75-.55	.016
.80-.80-.60	.012

Abstracts

Oils and Fats

Edited by
M. M. PISKUR and SARAH HICKS

COCONUT OIL. *Soap 18*, No. 3, 21-4, 67 (1942).

A REVIEW OF THE ROLE OF LIPIDS IN THE MANUFACTURE OF LEATHER. Robt. M. Koppenhoefer. *J. Am. Leather Chem. Assoc. 37*, 118-31 (1942).

FATS FOR CANDY, MEETING THE COCONUT OIL SHORTAGE. J. A. O'Malley and C. E. Price. *Manuf. Confectioner 22*, No. 3, 13-15 (1942).

STUDIES ON THE CHEMISTRY OF THE FATTY ACIDS. IX. A SPECTROSCOPIC STUDY OF METHYL ARACHIDONATE PURIFIED BY CRYSTALLIZATION AND DISTILLATION AND ITS ALKALI ISOMERIZATION PRODUCT. D. T. Mowry, W. R. Brode, and J. B. Brown. *J. Biol. Chem. 142*, 671-8 (1942). A critical study of the method of isolating methyl arachidonate by crystallization and distillation has been made and the product thus obtained compared with that prepared by reduction of the octabromide. The absorption spectra of these samples show even better than the diene no. and molecular refraction that these samples are relatively free from conjugated unsaturation. A correction has been recommended for the empirical factor in the equation for the estimation of methyl arachidonate by the polybromide no. The kinetics of the alkali isomerization of arachidonic acid have been followed spectroscopically and the similarity to the behavior of the 1, 4, 7-triene system present in linolenic acid noted. The alkali isomerization product of arachidonic acid has been described.

ADRENALECTOMY AND THE ABSORPTION OF DIFFERENT FATS. R. H. Barnes, I. I. Rusoff, and Geo. O. Burr. *Proc. Soc. Exptl. Biol. Med. 49*, 84-7 (1942). The rate of absorption of corn oil, olive oil, hydrogenated vegetable oil, and mutton tallow is not significantly changed from the normal by adrenalectomy. The absorption of hydrogenated vegetable oil fed as an emulsion with skim milk is significantly decreased following this operative procedure. Evidence for certain changes in fat absorbing mechanisms that are brought about by removal of the adrenals is presented, and it is pointed out that these changes need not result in an altered rate of absorption.

PATENTS—OILS AND FATS

SOLVENT-EXTRACTION PROCESS AND APPARATUS. M. Bonotto (Extractol Process, Ltd.). *U. S. 2,273,557.* A counter-current solvent oil extrn. system is described.

IMPROVEMENTS IN PROCESSES FOR PURIFICATION OF OILS. J. Bibby & Sons, Ltd. *Brit. 520,233.* A process for removing impurities from oil or other liquid comprises the step of adding a solid adsorbent or the like to an oil or to a soln. of the oil or to the other liquid, and the subsequent step of removing suspended matter by a process of electrostatic precipitation.

RECOVERY OF WOOL GREASE. Chas. R. Brown (The Sharpless Corp.). *U. S. 2,271,621.* In the manufacture of a purified wool grease from a crude wool grease contaminated with insoluble impurities and suint, the process comprises mixing with crude wool grease an aq. soln. of an abietic acid salt, and separating the resulting aq. phase and associated insol. impurities from the wool grease.

A PROCESS FOR THE REFINING OF VEGETABLE AND ANIMAL OILS OR FATS. Aktiebolaget Separator. *Brit. 520,285.* A process for the refining of vegetable or animal oils or fats comprises neutralizing the oils or fats and precipitating the soap and thereafter effecting centrifugal separation, wherein said centrifugal separation is carried out in a centrifugal bowl so designed that three fluid components, *i.e.,* oil, soap, and aq. soln. are discharged continuously and separately from the centrifugal bowl.

PHOSPHATIDIC COMPOUNDS. Morris Mattikow (Refining, Inc.). *U. S. 2,271,127.* A process of producing new phosphatidic compounds comprises heating phosphatidic material with a compound having a free hydroxy group in the presence of a basic material as a catalyst.

Abstracts

Soaps

Edited by MARY GRIFFITH

FOAMING PROPERTIES OF WINE. Maynard Amerine, Louis Martini, and William DeMattei. *Ind. Eng. Chem. 34,* 152 (1942). Glycerol was found to increase the foam stability markedly. Oleanolic acid increased foaminess. Causes and foam prevention were discussed.

FORTY-FIVE YEARS OF CHEMISTRY IN A SOAP PLANT. Martin Hill Ittner. *Ind. Eng. Chem. 34,* 253 (1942). Mr. Ittner reviews his work in the soap plant on hydrolyzing, phenolics, Na silicate and tin as antioxidants, hydrogenation, use of hydrogenation equipment for flotation, refining bergamot oil, synthesizing bergamot substitutes, centrifugal purification of soap, substitutes for rose oil, prod. of phenyl ethyl alcohol, ethyl citronellal, glycerol recovery, counter-current hydrolysis, soap from petroleum, and detergents.

REVERSED (CATION-ACTIVE) SOAPS. *Perfumery and Essential Oil Record 33,* 1, 24 (1942). Examples are fatty acylated nitrogen compounds, pyridine salts and quaternary ammonium compounds. Soaps and cation-active compounds precipitate each other. Trimethyl cetyl ammonium bromide is one of the best frothing agents known. Sapamines are quaternary ammonium compounds, which are used as softening agents for cotton and rayon fabrics. These compounds are very useful in dyeing, insecticides, cosmetics, washing wool in acidic media, shampoos, and emulsifying essential oils. Cationic soaps exert a redeposition of dirt in suspension, which property is useful in applying white pigments to rayon.

CONDUCTOMETRIC ASSAY OF INORGANIC SALT IN THE PRESENCE OF WETTING AGENTS. J. H. Percy and C. J. Arrowsmith. *Ind. & Eng. Chem. Anal. Ed. 14,* 151-3 (1942). A method is described for the rapid assay of active ingredient in commercial wetting agents by a conductometric method. It is not necessary for the chemical nature of the material to be known so long as a small amt. of material free of inorganic salt can be isolated for the calibration curve. The method may be applied wherever the components of a mixture have materially different specific conductivities in soln.

PATENTS

SOAP. Winfrid Hentrich and Eberhard Elbel (Procter and Gamble Co.). *U. S. 2,263,729.* The foaming and solubility of soap is enhanced by the addition of alkyl phenoxy acetic acid and builders.

LIQUID SOAP. Nathaniel Tucker (Procter and Gamble Co.). *U. S. 2,264,103.* The clouding of liquid soap is prevented by incorporating triethanolamine citrate to soften water.

SOAP. Benjamin Thurman (Refining, Inc.). *U. S. 2,271,406.* In the process of saponification, an oil is added to molten caustic and heated for some time to produce a hard and stable soap, which is accomplished by shifting the double bond of unsaturated acids, and shortening the chain length.

PHOSPHATIDES. Benjamin Thurman (Refining, Inc.). *U. S. 2,271,409.* Alkali metal phosphates are reacted with phosphatides to produce compounds useful in shortening, as emulsifying agents in cosmetics, insecticides, water softeners in soap, pigment dispersions, flotation processes, surface tension reducers, etc.

PHOSPHATIDES. Benjamin Thurman (Refining, Inc.). *U. S. 2,271,410.* Lower hydroxy fatty acids are reacted with phosphatides to produce compounds useful as emulsifying agents in cosmetics, soaps, insecticides, pigment dispersing agents, antioxidants, hygroscopic agents, anti-spattering agents in shortening, etc.

SOAP. George Bradshaw and Walter Meuly (E. I. du Pont de Nemours and Co.). *U. S. 2,271,619.* In the manufacture of soap, methanol is added to coconut or cottonseed oil to form Me esters; fractionate out the Me esters of C_8 and C_{10} acids, hydrogenate, crystallize or make soaps of still residue (C_{12-18}).

UTILIZATION OF SOAP SCRAP. A. Keeble. *Brit. 534,809.* Scrap soap is utilized by adding it to the oil after the addition of Na carbonate, and before the addition of caustic. Rosin may be added before the alkali.