A monograph giving preparation, properties and uses of metallic soaps was written by L. Ivanovsky (*Seifensieder Ztg. 65*, 671, 713, 733, 752, 771, 792, 812). The uses discussed pertain to paint driers, organic synthesis, paints, lacquer, varnish, dyeing, glass and porcelain painting, dry cleaning, lubrication, wax, candles, polishing agents, resins, cosmetics, medicine, beverages and other miscellaneous uses. A discussion of the properties of aluminum stearate lubricating greases was by F. Licata (*Ind. Eng. Chem.* 30, 550). Patents on greases containing metallic soaps were issued to G. Kaufmann (*U. S. 2,108,016; 2,108,672*), L. Brunstrum and E. Adams (*U. S. 2,108,643-4*) and G. Suit (*U. S. 2,121,748*).

General information on the properties of several metallic soaps as related to their use in the protective coating industry was prepared by F. Licata (*Drugs, Oils & Paints* 53, 173). Varnish containing about five per cent calcium stearate protects textile cable coverings and renders them non-wettable by mineral oil. A method of preparing metallic soaps by reacting metallic halides with fat acids was patented by W. Plechner (*U. S. 2,132,997*).

The committee that assisted the chairman in preparing this paper by reviewing and submitting additions, suggestions and corrections is composed of:

R. C. NEWTON
H. A. MATTILL
GEO. S. JAMIESON
G. R. GREENBANK
M. M. PISKUR, Chairman.

*(To be continued)*

# ABSTRACTS

## Oils and Fats

Edited by
M. M. PISKUR and RUTH LINDAHL

INDUSTRIAL QUESTIONS ON APPARATUS AND MACHINES FOR THE FAT INDUSTRY. K. Schober. *Fette u. Seifen 46*, 71-7 (1939). Comparative tests on many metals for use in equipment of the oil, fat and soap industry are presented.

SEPARATORS (CENTRIFUGES) FOR THE FAT INDUSTRY. W. Schneider. *Fette u. Seifen 46*, 77-82 (1939).

CENTRIFUGES AND ROLL DRYING IN THE RENDERING INDUSTRY. W. Martin. *Fette u. Seifen 46*, 82-6 (1939).

THE THEORY AND DEVELOPMENT OF HIGH-VACUUM DISTILLATION. C. R. Burch and W. J. D. Van Dijck. *J. Soc. Chem. Ind. 58*, 39-42 (1939). Mol. Distn. is characterized by the use of permanent gas pressures so low ($10^{-6}$ atm.) as to play no essential part in detg. the speed of distn., or even whether distn. takes place or not. The historical devel. of this method of distn. and the theoretical considerations governing the process, are outlined, and factors limiting the large-scale appln. are discussed. Two types of "self-pumping still" which remove the limit set by the finite rate of gas flow in the still itself, are described. The limit set by splashing due to traces of decompn. remains.

SYNTHETIC GLYCERIN — CAN IT BE PRODUCED COMPETITIVELY? H. A. Levey. *Chem. Ind. 44*, 143-5 (1939) Review. Bibl. contains a list of about 50 patents.

HEAT BLEACHING OF FATTY OILS. P. D. Boone. *Soap, 15*, No. 2, 23-5, 32 (1939). Both batch & continuous processes have been employed by investigators. Steam or other inert gases are frequently employed, supplemented sometimes by a vacuum, vacuum alone has been used. The effective temperature varies with the type of oil, and also doubtless on operating conditions. Heat bleaching of oils for the soap kettle might find wider uses in the interest of economy.

QUANTITATIVE DETERMINATION OF STEARIC ACID IN FATS. A. Heiduschka and W. Böhme. *Z. Untersuch. Lebensum. 77*, 33-8 (1939). With the development of new thermostat and filtration and extn. app., which are described, the modified Hehner and Mitchell method (Analyst 21, 316) for detn. of stearic acid was improved to 1% possible error. Method: To 0.5 g. sample in a 200 cc. tared Erlenmeyer flask add 100 cc. stearic acid soln. (4.5 g. stearic acid to 1.1 99% alc. at 20°); place in thermostat, stir and maintain at 0° for 6 hrs. The ppt. is filtered and extd. in a special app. A table of corrections (—3 to +2) is included. Arachidic and behenic acids are pptd. with stearic acid. The breast, back and kidney fat, resp., of beef contain 7.5, 11.0 and 27.0% stearic acid; for pork the figures are 12.0, 13.5 and 30.0% resp.

SIMPLE METHOD FOR DETERMINING THE UNSAPONIFIABLES AND COMPOSITIONS IN FOOD FATS. J. Grossfeld. Z. *Untersuch. Lebensm. 76*, 513-30 (1938). Two unsap. detns. are made using a ratio of 1:10 (A) and 1:80 (B), resp., of fat to petrol ether. Method A: Weigh 5 g. fat in 100 cc. bottle; add 20cc. 95% alc. and 3 cc. 47% NaOH, saponify, and cool. Add 50 cc. petrol ether, shake once, add 20 cc. water, shake 30 times and let stand until the next day. The evapn. residue of a 25 cc. aliquot of solvent is detd. Method B: To the point of standing until the next day the method is similar to method A except use of 2.5 g. sample, 1 cc. 47% NaOH, 200 cc. petrol. ether and 12 cc. water. Aliquot 150 cc. of solvent soln., add 20 cc. .01 N. NaOH, let stand until next day. The evapn. residue of 100 cc. aliquot is detd. The % of sterines (y), hydrocarbons (x) and total unsap. (x + y) are calcd. from the unsap. results derived by method A (p) and method B (q) and the use of constants m and n in the equations: $x = p\frac{m(q-p)}{n-m}$ and $y = 100\frac{q-p}{n-m}$. Constants m and n were detd. by adding sterines to oils and testing. For butter fat, whale oil, linseed oil, peanut oil, olive oil, cacoa butter and lard the av. figures 26 and 74 (resp., m and n) can be used; for coco fat m = 44 and n = 82. The method depends on the different amts. of sterines extd. by the two detns. Coco fat soap retains less

sterine, thereby causing large m and n values. Data on all the above listed oils is tabulated. Cacao butter contains 0.0-0.09% hydrocarbons and 0.42-0.60 total unsap. This is easily differentiated from cacao extn. fat whose figures are 0.54-.90% hydrocarbons and 1.88-2.77% total unsap. Tests show that presence of cetyl alc. would complicate the detn.

CHEMISTRY OF FAT SPOILAGE. V. THE ANALYSIS DIFFERENTIATING THE ALDEHYDES FORMED. K. Täufel and K. Klentsch. *Fette u. Seifen 46.* 64-6 (1939). The literature suggests that during deterioration of fats low mol. wt. aldehydes and high mol. aldehydes are formed from the fat and also protein material in the fat. In using chloroform and water solvents together and testing with fuchsine-$SO_2$ sol. the low mol. wt. aldehydes, formaldehyde to valeric, give a red color in the water layer which is insol. in the chloroform while higher aldehydes yield a violet blue color in both the water and chloroform layers. The test on fats is by obtaining 1 cc. of distillate from 5 g. of sample and 20 cc. sat. salt sol. and testing the distillate. Various olive oils gave indications of contg. both low mol. wt. and high mol. wt. aldehydes.

STUDIES ON THE NATURE OF ANTIOXYGENS PRESENT IN NATURAL FATS. IV. THE PROPORTIONS AND PROPERTIES OF ANTIOXYGENIC COMPOUNDS IN VARIOUS EXTRACTED SEED CAKES. T. P. Hilditch & S. Paul. *J Soc. Chem. Ind. 58,* 21-4 (1939). Antioxidants were extd. from several oils with acetone, and their properties were reported. Hilditch and Paul believe that they have established the presence of another group of natural antioxygenic compounds present in seeds, this group being characterized by its basic, or pseudo-basic, nature. That other naturally-occurring compounds also possess antioxygenic power is to be expected, especially if, as is not unlikely, the presence of a polyphenolic group is the active factor in all cases. Such a group is present, for example, in the tocophenols, & also in the gossypol of cottonseed, either of these possessing marked antioxygenic properties without the concurrent presence of a basic group.

STUDIES OF FAT-FREE DIETS. G. J. Martin. *J. Nutr. 17,* 127-141 (1939). The min. level of methyl linoleate for optimal growth effects has been tentatively placed at or below 1 drop per day per rat. The inability of methyl linolenate to supplement methyl linoleate is proved.

VITAMIN E DESTRUCTION BY RANCID FATS. J. Weber, M. H. Irwin and H. Steenbock. *Amer. J. Physiol. 125,* 593-600 (1939). A partially hydrogenated vegetable shortening, incorporated at a 5% level in an otherwise vitamin E-deficient ration, restored fertility in female rats whose previous gestations had ended in resorption. This activity was destroyed by certain fats made rancid by aeration, by heat in the presence of oxygen, by treatment with ozone, or by addn. of palmitic peroxide. No destruction was observed with fats heated under nitrogen reflux, nor with fats to which acrolein, allyl alc., or straight-chain aldehydes and ketones had been added. When a moderately rancid fat and a source of vitamin E were administered separately to avoid a possibility of reaction in the ration and in the gastro-intestinal tract, no destructon of the vitamin occurred, — contact in the ration was shown to bring about destruction. A 3-fold increase in the amt. of vitamin E necessary to produce litters on a fresh fat diet did not overcome the destructive action of a fat made moderately rancid by aeration.

A NOTE ON THE VITAMIN $B_1$-SPARING ACTION OF FAT. D. Melnick and H. Field, Jr. *J. Nutr. 17,* 223-6 (1939). Chemical analyses have indicated that lard contains no thiamin, justifying the conclusion that the vitamin $B_1$-sparing action of fat cannot be attributed to actual admin. of the vitamin but to the decreased metabolic requirements for thiamin when the fat content of the diet is increased.

## PATENTS

METHOD OF HYDROGENATION OF FATTY ACID GLYCERIDES. I. Seto and M. Sato. (to Minami Manshu Tetsudo Kabrishiki Kaisha). U. S. 2,147,177. The apparatus is supplied with electrodes. During hydrogenation the charge is subjected to A. C. current. After hydrogenation D. C. current is used to draw the catalyst to the wall of the app. and the oil is removed. The catalyst remains in the app. for use with the next charge.

METHOD AND APPARATUS FOR COMMINUTING AND EXTRACTING FATTY SUBSTANCES, BEET ROOT AND FRUIT. Gesellschaft zur Verwertung Fauth'scer Patente m. b. H. (to Fauth Patent A.-G.). Brit. 491,106, Aug. 26, 1938. Oils seeds, etc., are pressed in a pressure worm, with solvent if desired, to form a coherent mass of rope-like form which is then comminuted and spread in a thin layer, with addnl. solvent if necessary, upon a traveling filter band through which the ext. passes. (*Chem. Abs.*)

HIGHER FATTY ACIDS. New Process Fat Refining Corp. Ger. 665,874, Oct. 7, 1938 (Cl. 23*d*. 1). A process and app. are described for obtaining higher fatty acids by subjecting fats to steam-distn. The residue is constantly removed. The substance to be distd. is heated to 205-315° in an air-free distn. column to soften it. A current of superheated steam is led in at such a temp. that the bottom of the column is at 300-360° and the issuing steam and fatty acid vapor are at 199-288°. (*Chem. Abs.*)

HARDENING OILS AND FATS. Henkel & Cie. G.m.b.H. Fr. 828,883, June 1, 1938. An oil, fat or fatty acid to be hardened is mixed with a hydrogenation catalyst and treated with H at a high temp., if necessary under pressure, in a pipe, divided by elbows or curves into different sections the oil or the like being introduced without interruption at the upper end of the reaction tube and the finished product being evacuated at the lower end. The different sections may be heated separately to different temps. (*Chem. Abs.*)