# ABSTRACTS

## Oils and Fats

Edited by
**M. M. PISKUR and RUTH LINDAHL**

**Extraction of oil with a continuous expeller press.** M. Terres. *Fette u. Seifen* **44,** 483-5 (1937).

**Fat hydrogenation.** *Seifensieder-Ztg.* **64,** 901-3, 921-2, 941-2 (1937).—A review of the literature.

**Report on the 8th meeting of the International Commission for the study of fatty materials.** H. P. Kaufmann. *Fette u. Seifen* **44,** 480-2 (1937).—Titer, unsaponifiable, polybromide, hydroxyl, soap, moisture, rosin acids and chloride detns. for fats or soaps were discussed and several recommendations made.

**Collaborative work of the D. G. F. 7. Determining the unsaponifiable, the polybromide number and the hydroxyl number.** H. Fiedler. *Fette u. Seifen* **44,** 471-80 (1937).—A review of the tabulated data indicated that in almost all cases individuals did not check well in detg. unsaponifiable, the polybromide no. and Ac no. by several current methods; various individuals also did not check well when using the same method. All methods are discussed from the standpoint of accuracy. Several modified methods are proposed.

**Analytical methods committee. The determination of unsaponifiable matter in oils and fats.** H. K. Cox. *Analyst* 62, 863-4 (1937).—Polemic. Kaufmann reported that in certain cases the caustic alkali specified in English methods is insufficient. The author notes that the method specifies alc.-KOH not less than 0.50 *N* under which conditions there should be no deficiency. The use of ethyl ether as the solvent is favored.

**The nature of the sterols in cottonseed oil.** E. S. Wallis and P. N. Chakravorty. *J. Org. Chem.* **2,** 335-40 (1937).—An examn. has been made of the nature of the sterols present in cottonseed oil. Evidence is submitted which shows that the chief part of the sterols present is $\beta$-sitosterol. No evidence for the presence of a second phytosterol could be obtained. The absence of $\gamma$-sitosterol and stigmasterol is confirmed. The absence of both $\delta_1$- and $\delta_2$-sitosterols is demonstrated. An analysis of the saturated sterols by the method of Schoenheimer shows that stigmastanol is present to an extent of less than 1%. Cottonseed oil is an excellent source for $\beta$-sitosterol.

**Further determination and characterization of the component acids of butter fat.** T. P. Hildtich and H. E. Longenecker. *J. Biol. Chem.* **122,** 497-506 (1938).—The presence of decenoic, do-, tetra-, and hexadecenoic acids has been demonstrated; the ethenoid linkage in each unsatd. acid occupied the $\Delta^{9,10}$ position in the carbon chain. Bromination and mild oxidation with permanganate of the $C_{18}$ unsatd. acids confirm earlier conclusions regarding the presence of only oleic acid and an octadecadienoic acid. The presence of arachidonic acid was indicated by a study of its bromo-additive products. Satd. acids which have been isolated and identified were octanoic, n-decanoic, lauric, myristic, palmitic, and stearic. The analysis for the component fatty acids of milk fat, one of the most complex of all fats, is apparently accomplished with similar results when either an electrically heated and packed column for the fractional distillation of ester mixtures, or some apparatus is employed.

**Detection and determination of diacetyl and methylacetylcarbinol in margarine, butter, butter odor mixes of commerce and the like.** H. Schmalfuss and H. Werner. *Fette u. Seifen* **44,** 509-14 (1937).—Current methods are reviewed. The authors suggested first running a qualitative test which requires 7 min.; if positive, a quan. analysis which requires ½ hr. is performed. They found that the lowest amt. of detectable diacetyl in water or paraffin oil was 0.000012 g., in slightly rancid margarine .000016, in rancid margarin .000024 g. Two g. of milk sugar were heated in a flask over a free flame and the gases emitted were passed through 10 cc. of satd. salt soln. Tests on the salt soln. yielded an abundant red ppt. of Ni-dioxime. In a similar test with citric acid no ppt. was obtained.

**Variations in the softness of lard produced in the record performance testing.** J. L. Lush, B. H. Thomas, C. C. Culbertson and F. J. Beard. *Proc. Am. Soc. Animal Production, 29th Ann. Meeting* **1936,** 258-9.—The Hanus I no. of lard from the back fat of female hogs averaged 1.7 higher than that of males from the same litter. The feeding of 2.5-3.0 lb. cod-liver oil per hog in approx. 120 days caused a marked softening of the back fat and increased the I no. an av. of 6.1. (*Chem. Abs.*)

**Studies on the chemistry of the fatty acids. III. The properties of linoleic acids prepared by debromination and by low temperature crystallization, with a proposed method of quantitative estimation.** J. B. Brown and J. Frankel. *J. Am. Chem. Soc.* **60,** 54-6 (1938).—Unsatd. fat acids of corn oil were brominated in cold ether. The product was washed with $Na_2S_2O_7$ soln., dried and the tetrabromides were recovered by ppt. with petrol. ether. The Br was removed by Zn and HCl, the methyl esters were prepd. and distd. and saponified to yield pure linoleic acid. Two products had a m.p. of —6.8 and —7.0 and $n^{20}$ 1.4691 and 1.4682. A more detailed method of accomplishing the above separation carefully to give quant. data on amt. of linoleic acid present is given.

**The interaction between proteins and fatty acids on the surface of aqueous solutions.** H. Neurath. *J. Phys. Chem.* **42,** 39-46 (1938).—Mixed films of ovalbumin and myristic acid have been prepared by spreading a soln. of K myristate and ovalbumin on the surface of N/10 HCl. If it is assumed that the protein occupies the same area as in the pure film of that substance, no appreciable interaction between the 2 compds. could be found with films contg. between about 400 and 100 mols. of myristic acid per mol. of protein. With films contg. less than 100 mols. of myristic acid, a marked increase of the area per mol. of fatty acid

# ABSTRACTS

## Oils and Fats

*Edited by*
**M. M. PISKUR and RUTH LINDAHL**

sets in which, with a mole ratio of 9, reaches a value of more than 180 sq. A. U. The hypothesis has been advanced that within this range of concn. the films are in the vapor-expanded or gaseous state, owing to a sharp decrease of the lateral adhesion between the mols. of the fatty acid. This decrease of the lateral adhesion is presumably brought about by attractive forces acting between the carboxyl groups of the fatty acid and the positively charged groups of the protein film.

**Fat absorption and dialysis of fat acids.** F. L. Breusch. *Biochem. Z.* **293,** 280-94 (1937).—Satd. fat acids with 16 C or more and oleic acid, whether in aq. colloidal soln. or in the form of soaps in the presence of bile salts, do not diffuse through parchment. The Na salt of oleic acid, however, dialyzes through cellophane. Satd. fat acids with less than 16 C are diffusible, and their diffusibility as well as soly. in the bile salts increases with diminution in mol. wt. Linoleic acid dialyzes quite readily while the unsatd. ricinoleic acid just barely diffuses. In the case of the diffusible lower acids the soaps are about 5 times as dialyzable as the colloidal solns. of the free acids in bile salts. Aq. colloidal solns. of lecithin, which themselves dialyze slowly, increases the rate of dialysis of Na glycochocolate 3-5 times, but do not affect the diffusion of soaps. (*Chem. Abs.*)

**Fatty livers in the goose produced by overfeeding.** E. V. Flock and H. R. Hester. *Proc. Staff Meetings Mayo Clinic* **12,** 677-9 (1937).—When large fatty livers are produced in geese by stuffing with a high carbohydrate diet, the fat is more satd. than normal because of a decrease in the usual proportion of the more highly unsatd. fatty acids. Of particular interest is the fact that the liver fat is even more satd. than depot fat.

**The control of liver fat by triethyl-β-hydroxyethylammonium hydroxide.** H. J. Channon, A. P. Platt, J. V. Loach and J. A. B. Smith. *Biochem. J.* **31,** 2181-86 (1938).—A control group of animals received a "fat" fatty liver-producing diet while other groups received the same diet with the addn. of either choline or triethyl-β-hydroxyethylammonium hydroxide. The phosphatides were prepd. from the livers and the bases obtained by hydrolysis. After removal of cholamine, the chloroaurates were prepared and fractionally crystallized. No evidence was obtained of the presence of triethyl-β-hydroxyethylammonium hydroxide in the livers of the animals receiving this base, even though the liver fat had been markedly decreased. A second experiment was carried out on the "cholesterol" fatty liver with the same result.

**Improving the drying capacity of sunflower seed oils by elaidinization and removing the elaidins formed.** G. Rankoff. *Fette u. Seifen* **44,** 465-71 (1937).—Several samples of sunflower oil were elaidinized with different amts. of $HNO_3$ and $NaNO_2$ for various time periods and then washed with water. A solid fraction was sepd. by crystn. in acetone at 0 to —5°. The liquid portion had a larger acid and sapon. value and lower I and SCN value than the original oil. Analyses of both solid and liquid fraction are given. Drying tests show that the liquid portion became non-tacky in 10 days; the original oil required 23 days. However, after 60 days' drying test the liquid fraction from elaidinization contained more liquid portion than a test sample of the original oil. The former can be removed in a ribbon form with a scraper while the latter slides together under a knife. A 10-day oil film of liquid portion sinters at 134-140°, while a 10-day film of sunflower oil melts at 85-90°. Tests comparing the 2 products in a varnish formula are also presented.

**The study of drying oil problems by experiments in monolayers.** G. Gee. *J. Soc. Chem. Ind.* **56,** 1132-4 (1937).—Monolayers of the unsatd. esters employed in the mixed film experiments were examd. for stability on 0.01 *N*-sulphuric acid. The linoleate and linolenate were both stable, whilst methyl β-elaeostearate autoxodized slowly at a rate which was accelerated by the presence of Co ions in the substrate and retarded by increasing the surface pressure. The final film was still quite fluid, and there is no reason to suppose that polymerization occurred. A few experiments with β-elaeostearin showed this material to undergo rapid polymerization in monolayers, with the formation of a gel-like film. In this case it is probable that cross-linking of the polymeride molecules has occurred, a process which is, for steric reasons, much more difficult in the case of the maleic anhydride compound.

**The preparation of ketones from higher fatty acids. III. The preparation of ketones from the fatty acids of hydrogenated sardine oil. IV. The preparation of ketones from the fatty acids of coconut oil and hardened rapeseed and soybean oils.** K. Kino. *J. Soc. Chem. Ind., Japan* **40,** Suppl. binding 311-12 (1937).—Fatty acids, obtained from raw coconut oil and from sardine, rapeseed and soybean oils of various degrees of hydrogenation, were heated with equiv. wts. of Mg powder at 330-40° and 300-50° resp. The m.ps. of the resulting ketones and the temp. of decompn. increase with the mol. wts. of the chief fatty acids in the mixt. The m.ps. of ketones from rapeseed and soybean oils of equal degree of hydrogenation differ but little. For oils of different degree of hardening, the m.ps. of the ketones increase with the decrease in the contents of unsatd. acids. The latter rule is more characteristic of the coconut-oil fatty acids, which are difficultly converted into ketones at 300-10°. In general, the lower the I no., the easier is the conversion of fatty acids into ketones. (*Chem. Abs.*)

### PATENTS

**Fatty oils rich in vitamins.** K. Kawai. Brit. 465,547.—Livers are heated with alkali and the vitamins are extracted with oil.

**Refining vegetable and animal oils.** B. Clayton, W. B. Kerrick and H. M. Stadt (Refining Inc.). U. S.

# ABSTRACTS

## Oils and Fats

**Edited by**
**M. M. PISKUR and RUTH LINDAHL**

2,100,274-5.—Arrangements of app. for continuous treatment of oil with alkali followed by centrifuging in order to refine the oil are described. U. S. patents 2,100,276-7 modifications of the above app.

**Process of preparing fat and oil splitting enzyme from plant seeds.** B. Takamiya. U. S. 2,102,101.—Fat and oil splitting enzymes are prepd. from seeds and plant materials by treatment with 0.6 to 1.2 normal acid. The enzymes split off and can be separated.

**Splitting and hydrogenating fats.** Hans Kaufmann. Brit. 468,170.—In the production of hardened fatty acids, the oil or fat is first partly hydrogenated or partly hydrolyzed and then in the same app., hydrogenation and hydrolysis are effected together. In an example, 100 lb. sunflower oil is heated to 200° for 2 hrs. with 0.01 lb. Ni as formate in H at 20 atm.; 100 lb. preheated $H_2O$ is then forced into the autoclave which is maintained at 180-220° for 3 hrs. more. (*Chem. Abs.*)

**Fat acids.** Hans Kaufmann. Fr. 811,797.—Fat acids suitable for soap making are obtained by treating an oil or fat with H in the presence of a catalyst, preferably under a high pressure and to the desired degree, the amt. of water necessary for the splitting being introduced afterward into the same app. In a modification the splitting takes place 1st and the H and catalyst are afterward introduced. (*Chem. Abs.*)

# ABSTRACTS

## Soaps

**Edited by M. L. SHEELY**

**Carbon dioxide derivatives in soap manufacture.** *Soap Perfumery and Cosmetics* **10,** 1045 (1937).—According to a recent Hungarian patent application by Dr. J. Leimdorfer, the use of carbanides is of advantage in soapmaking. Fatty oils and fats may be divided into two groups: (a) castor oil, coconut oil, palm kernel oil type, and (b) tallow, bone fat, sunflower oil type. The former is characterized by easy saponification with strong lye at moderate temperature, and are suitable, inter alia, for Eschweger and transparent soaps. Materials of the second group may, however, be quite as readily used as those of the first for similar types of soap if a carbon dioxide derivative, e.g., carbamide, is incorporated with the fat charge. The products have improved wetting and lathering properties, the formation of lime soap is prevented, and the soaps generally have better texture, appearance, transparency, etc. By way of example, the following recipe may be used: 50 parts tallow and 50 parts olive oil are emulsified in a solution of 15.8 parts caustic soda and 7.5 parts carbamide (urea) in 43 parts water at 38° C. and the emulsion is poured into moulds to set.

**Descha system of saponification.** J. Schaal. *Soap Perfumery and Cosmetics* **10,** 1046 (1937). (*Fette u. Seife* **44,** 55-7.)—A new boiling process for soap base and curd soaps. Some further details of this method are given. It was first introduced by the author in 1933, and, as is probably well known, it provided a means for very rapid saponification—in about two hours—yielding a soap which answered all requirements for high quality. In fact, it was claimed that the product could be immediately milled into good class toilet soap, owing to the large content of glycerin left in the soap, imparting valuable cosmetic properties. Some further details are now given of the process which has been modified to meet the growing scarcity of glycerin in Germany and the new regulations governing the use of neutral oils and fats in soapmaking. In its modified form the Descha process now leaves little or no glycerin in the soap. Under the older method it was possible to produce from 100 kilos of neutral fat about 132 kilos of soap. The new method is described in detail.

**Practical soap making. I. Manufacture of grain soap.** H. Manneck. *Fette u. Seifen* **44,** 202-5 (1937).—The modern technic of soap making is reviewed with special attention to the chemistry and colloid chemistry of sapon., salting out and bleaching. **II. Fillers for soaps.** 1. Cl. Bauschinger. *Ibid.* 352-5.—This review mentions the use of neutral salts (e.g., chlorides or sulfates), carbonates, silicates, alkali phosphates, org. materials, (e.g., starch or cellulose derivs.), enzymes and insol. fillers, e.g., talcum. Attention is devoted to the advantages of using water glass and metasilicates as soap fillers. (*Chem. Abs.*)

**Moisture in vegetable oil.** P. Z. Zaichenko, V. P. Rzhekhin and N. I. Pogonkina. *J. Applied Chem.* (*U.S.S.R.*) **10,** 908-16 (1937).—Shake 10-15 grams of oil with 1-2 grams of 88-90 per cent glycerine in a test tube for 5 minutes, centrifuge for 1-2 minutes, shake again for 2 minutes and again centrifuge for 2 minutes. Withdraw the glycerine from the tube and determine its refractive index. The percentage of moisture in the oil is equal to

$$0.03 + \frac{(760\ [n_0 - n]\ p)}{m}$$

where 0.03 is the correction for the residual moisture in