

ABSTRACTS

Oils and Fats

Edited by

W. F. BOLLENS and M. M. PISKUR

New applications of the refractometer to analysis of fats. Wolfgang Leithe. *Chem.-Ztg.* 59, 325-7 (1935); cf. *C. A.* 29, 1897².—In this review of L.'s previous work, the refractometric method of deg. fat after extn. with petroleum benzine is applied to fats from widely different sources. P. S. ROLLER.

Shredded suet: A new material used for coating. J. T. Dunn and H. Charles L. Bloxam. *Analyst* 60, 320-1 (1935).—A sample of shredded suet contained 6.5% soybean meal (used as a coating), 91.5% fat and 2.0% water. W. T. H.

Vegetable oils and the Diesel engines. M. Gautier. *Rev. combustibles liquides* 13, 129-36 (1935).—Since a previous study showed that Diesel engines of 5-20 h. p. could run on peanut oil, further tests with peanut, palm and linseed oils were made. Various tables and diagrams are given showing comparison with gas oil. The results were encouragingly favorable, 6 reasons being cited. The motor had a mech. injector, with the usual injection point of 11° advanced to 12°. HARRY E. SILLIMAN.

Apparatus for the determination of the unsaponifiable components of fats, oils, waxes and fatty compositions of all kinds. *Seifensieder-Ztg.*, 62, 342-3 (1935.) The apparatus described isolates the unsaponifiable constituents from an aqueous solution of a saponified fat, etc., by continuously and automatically extinguishing said solution with petroleum ether. The apparatus is especially suitable for routine laboratories examining fat products. (*C. A.* 29, 14, 4959, July 20, 1935.)

Thorn apple seed oil. Kh. Lyutenberg and S. Ivanov. *Allgem. Oel- u. Fett-Ztg.* 32, 141-6 (1935).—Petr. ether extd. 10.3% oil from unripe seeds, 28.7% from half-ripe and 22.4% from ripe seeds. The following consts. were detd.: $n_{40/D}$ 1.4675, 1.4675, 1.4672; acid no. 20.42, 3.43, 1.50; sapon. no. 227.6, 189.3, 183.7; ester no. 207.2, 185.9, 182.2; I no. 131.1, 127.7, 126.3; and thiocyanate no. 78.6, 79.6, 76.5, resp., on oil from unripe, half-ripe and ripe seeds. The fat acids are oleic 30.3, 36.6, 31.0; linoleic 60.6, 55.5, 57.5 and satd. 9.1, 7.9, 11.5%, resp. (given in the same order as above). After heating for 1 hr. at 250° the oils dry in 4-5 days. The oil is a good raw material for the soap and varnish industries. The seeds after the oil has been extd. can be used as a raw material for the extn. of the alkaloids *atropine* and *hyoscyamine*. M. M. PISKUR.

Analytical properties of commercial sulfated alcohols. Frank M. Biffen and Foster D. Snell, *Industrial and Engineering Chemistry*, Analytical Edition, 7, 4, 234 (July 15, 1935.) The sodium salts of the alkyl sulfates of the type of lauryl sulfate are so similar in properties and uses to soap and to sodium salts of sulfonated fatty acids or even to sulfonated fatty glycerides that chemical distinctions must often be made. Therefore, analytical data have been obtained on three commercial grades, applying modifications of procedures commonly used in soap or sulfonated oil analysis. The data indicate that commercial alkyl sulfates are mixtures containing mainly sodium alkyl sul-

fate, and substantial amounts of sodium sulfate. The instability of the product to heat renders precautions in heating vital.

Qualitatively they are identified by their instability to heat, their stability to cold acids, lather properties when acidified, and their hydrolysis on long boiling with acid to liberate sodium bisulfate. Quantitatively, they may be estimated from the benzidine alkyl sulfate, the organic sulfate by hydrolysis, or less accurately from the loss at 110°C.

Some characteristic features of the glycerides present in marine animal oils. T. P. Hilditch, *Proc. 5th Pacific Sci. Congr.*, 5, 3647-61 (1934.) A review with 36 references. (*C. A.* 29, 11, 3867, June 10, 1935.)

Ketone formation in purified fats. VII. Judging the value of nutrient fats by means of their ketone content. H. Schmalfuss, H. Werner and A. Gehrke. *Margarine-Ind.* 26, 261-2 (1933).; *Chem. Zentr.* 1934, I, 970; cf. *C. A.* 27, 3838; 28, 7045³.—While an inexperienced person can detect ketonic rancidity and taste in a nutrient fat only when 60 γ per g. or more of methyl heptyl ketone or methyl nonyl ketone is present, an experienced person can detect 4 γ ; 2 γ methyl nonyl ketone can be detected by the salicylaldehyde method. W. A. MOORE.

Vegetable oils, grades of color to be simplified. *Oil, Paint and Drug Reporter*, 128, 3, 62 (July 15, 1935.) Some of the difficulties encountered in the color grading of vegetable oils may disappear as the result of a recent study at the National Bureau of Standards, Department of Commerce. The transmission of light of various wave lengths throughout the visible spectrum was determined for many oils from different plant sources and of varied geographical origin, from which data complete information on the color of the oils may be derived, the bureau reported. H. J. McNichols, of the bureau's fiber structure section, stated that the market value of vegetable oils is determined largely by their color. For many years this commercial color grading has been based entirely on the Lovibond system of colored glass standards. Difficulties in the use of this system have arisen in practice, involving costly disputes between buyer and seller. These difficulties can not always be ascribed solely to the method of color grading but are largely inherent in the problem of measuring the colors of the oils. As a result of the bureau's studies, it has been found that the major difficulty in the establishment of a satisfactory method for color grading lies in the fact that the oils contain several different coloring matters which may vary independently in concentration. This permits a wide two-way variation in color quality over the range of vegetable oils which is not fully covered by the grading method now employed. Persons interested in the subject, it was stated, decided an improved grading method based on a suitable two-dimensional scale of color quality which will more adequately cover the scale of vegetable oil colors and at the same time reduce or avoid the use of many material color standards and eliminate as nearly as possible the personal equation of the operator.

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Chemistry of highly unsaturated acids of marine animal oils. Wasaburo Kimra, *Proc. 5th Pacific Sci. Congr.*, 5, 3663-71 (1934.) A review of Japanese work; 42 references. (C. A. 29, 11, 3867, June 10, 1935.)

Apparatus for the determination of the unsaponifiable components of fats, oils, waxes and fatty compositions of all kinds. Welwart. *Seifensieder-Ztg.* 62, 342-3 (1935).—The app. described isolates the unsaponifiable constituents from an aq. soln. of a sapon. fat, etc., by continuously and automatically extg. said soln. with petr. ether. The app. is especially suitable for routine labs. examg. fat products. J. W. PERRY.

Varieties of fish oils and their uses. Louis J. Reisenstein. *Paint Varnish Production Mgr.* 12, 18, 20, 22-3 (June, 1935).—The chem. nature of fish oils, their outstanding characteristics and merits, the types of oils available and their applications, especially in protective coatings, are discussed. Processed and blown fish oils, kettled oils, fish oil-China wood oil combinations, film characteristics, waterproofing and 22 formulas are included. W. H. BOYNTON.

The dehydration of castor oil with acid earth as a catalyst. Teikichi Yamada. *J. Soc. Chem. Ind., Japan* 38, Suppl. binding 120-3 (1935).—The oil was heated with acid earth, while CO₂ gas served as agitator and inert atm. The degree of dehydration was measured by the I and Ac nos. of the treated oils. The dehydrating action was very gradual below 100°. The most effective temps. were 200-250°. The Ac no. decreased from 139.5 to 7.9 in 20 min. at 250° when 20% of acid earth was used in the mixt. At higher temp. a splitting action of the acid earth upon glycerides becomes prominent. Expts. were made on castor, linseed and cottonseed oils. Results are given.

KARL KAMMERMEYER.

Titrimetric determination of the iodine number by addition of bromine vapor. E. Rossmann. *Angew. Chem.* 48, 223-6 (1935).—The principle of the method consists in the reaction between a weighed quantity of Br upon the solid, liquid or gaseous test substances, and titration of the excess Br vapor. Substances with ordinary double bonds require about 200% excess Br with a reaction period of 15 min.; for sterically hindered double bonds an excess of 400-500% of a reaction time of 1 hr. becomes necessary. The calcn. of the I no. is as follows: $I\ no. = (12.69 \times 100/c) [(10a/79.92) - b]$, and that of the no. of satd. bonds: no. of double bonds = $[(10a/79.92) - b] (M/2 \times 10 \times c)$, where a = initial amt. of Br in mg., b = Br titrated back as excess, in cc. of 0.1 N soln., c = weight of sample in mg. and M = mol. wt. Many exptl. data are reported, almost all of which show good agreement with theoretical values. A considerable saving in the cost of detns. is claimed for the new method over older methods. Seventeen references. K. K.

Nature of the sediments formed on cooling sunflowerseed oil. A. Zinov'ev and I. Gurevich. *Masloboino Zhirovoe Delo* 10, No. 7, 25-8 (1934); *Chimie & industrie* 33, 935.—Freshly pressed sunflowerseed or linseed oil, when subjected to a low temp., forms a sediment of a nature resembling that of the sediment produced on keeping the oils for a long time at ordinary temp. Exposure of the oil for 2-3 hrs. at -12° to -15° results in the formation of sediment in 24-48 hrs.; subsequent repeated freezing of the filtered oil does not cause production of further amts. of sediment. If the oil contg. the sediment is heated to 50°, the vol. of the sediment decreases. Generally, the sediment consists of phosphates and of an albuminoid-gum complex; but with linseed oil, subjecting to low temp. probably also ppts. satd. glycerides.

A. PAPINEAU-COUTURE.

The characters of halibut-liver oils. Norman Evers and Wilfred Smith. *Pharm. J.* 134, 417 (1935); cf. C. A. 28, 666⁴.—In 33 self-prepd. samples the SbCl₃ blue value, vitamin A content, sp. gr., n_{40}^D , I no., sapon. no. and unsapon. matter were detd. The results are tabulated and the limits are compared with those given by Haines and Drummond (C. A. 28, 3258⁸), Lovern, *et al.* (C. A. 28, 1387⁷) and Brit. Pharm. Codex. As the limits show wide variation, those in the Codex require extension. In the detn. of the I no., the Rosenmund-Kuhnhehn method (C. A. 17, 3172; 18, 477; 19, 1353) is preferred to the Wijs method (Codex), as it gives more consistent results when a high proportion of cholesterol is present.

S. WALDBOTT.

Antioxidants and the autoxidation of fats. III. R. B. French, H. S. Olcott and H. A. Mattill. *Ind. Eng. Chem.* 27, 724-8 (1935); cf. C. A. 29, 948⁹.—Methods are described for estg. the length of the induction period of lard and lard-cod-liver oil mixts. by O absorption, for measuring the minute pressure changes occurring in a closed system during and following the induction period, and for detg. the peroxide content of autoxidizing fats by slight modifications of the usual thiosulfate titration procedures. The prolongation of the induction period by some natural antioxidants and several phenolic compds. is proportional to the amt. used. At the end of the induction period the level of peroxide in lard or lard-cod-liver oil mixts. is fairly uniform, irrespective of the length of the induction period or of the original peroxide content. In the case of one natural inhibitor, the unsaponifiable lipoids of wheat-germ oil, the effectiveness varied inversely with the amt. of peroxides in the fat mixt. whether these had accumulated slowly or were added in the form of an oil of high peroxide content. Under such conditions there seemed to be a mutual destruction of antioxidant and active peroxides.

E. SCHERUBEL.

Application of the thiocyanogen number for determination of the percentage of oleic and linoleic acids according to H. Kaufmann, in Indian oils and fats, that are free from linolenic acid. N. N. Godbole and Sadgopal. *Allgem. Oel. u. Fett-Ztg.* 31,

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435-8 (1934).—From figures on thiocyanogen nos. (A) (cf. C. A. 28, 4617⁸) and I nos. (B) the oleic and linoleic acid contents of various Indian oils and fats were detd. according to the following formulas: Percentage of satd. acid = $100 - 1.158A$, percentage of oleic acid = $1.162(2A - B)$ and percentage of linoleic acid = $1.154(B - A)$. The oleic and linoleic acid contents, resp., of some Indian oils and fats are as follows: Almond oil 78.63, 14.02, apricot pith oil 32.02, 41.9; peanut oil 56.15, 25.94; butter fat (cow) 34.47, 4.97; butter fat (buffalo) 37.9, 4.0; chaulmoogra oil 91.4, 4.74; coconut oil 10.34, 0; olive oil 26.8, 45.0; cacao butter 38.14, 0.66; lard 43.14, 9.32; mahua fat 37.47, 16.45; margosa oil 6.73, 2.3; beef tallow 33.58, 5.18 and mutton tallow 32.02, 6.85. Conclusion. In oils and fats that yield no hexabromide no. and contain no hydroxy acids, the oleic and linoleic acids can be detd. by the use of Kaufmann's thiocyanogen no.

M. M. PISKUR.

PATENTS

Neutral bleached edible oils and fats. U. S. 2,003,076, May 28, 1935. Wilhelm Gensecke (to American Lurgi Corporation). After separating the albuminous and mucilaginous matter from a colored edible oil or fat such as a crude maize oil, the free fat acids are separated by neutralization with alkali, and the oil or fat is heated to about 280° for a sufficient time to effect bleaching, free fat acids being formed and distilled off in a vacuum with the aid of an inert gas. (C. A. 29, 14, 4962, July 20, 1935.)

Bleaching fat acids, oils and fats. French 778,882, March 26, 1935. Oil, fat, etc., is heated to a point between its melting point and 100° and an alkali or alkali earth hypochlorite in water is added in successive small amounts sufficient for the desired bleaching. The oil, etc., is cooled before each addition, stirred with the hypochlorite, allowed to settle and finally reheated. (C. A. 29, 14, 4962, July 20, 1935.)

Production, fatty acid anhydrides. U. S. 2,001,211. Richard Muller, Heidelberg, and Erich Rabald, Mannheim, Germany, to C. F. Boehringer & Sachne, G. m. b. H., Mannheim-Waldhof, Germany. Production fatty acid anhydrides. (Chemical Industries, 37, 1, 53, July, 1935.)

Extraction of oils. Hônen Seiyu K. K. (Mitsuo Nakamura, inventor). Japan. 109,731, Feb. 23, 1935. A mixt. of CS₂ and EtOH (or EtOH contg. a small amt. of MeOH) is used to ext. oils. When the solvent is cooled, it is sepd. into two layers, the lower one (CS₂) contg. pure oils, and the upper one impurities.

Apparatus for extracting fatty oils. Karl Sohler. Brit. 422,530, Jan. 14, 1935. In app. consisting of a series of extractors for treating seeds and other oil-contg. materials in countercurrent with a solvent, the 1st extractor consists of a chamber in which is mounted a perforated feed pipe through which the material passes into a 2nd extractor.

Oil from seeds, fruits, etc. Ateliers de construction mécanique de Tirlemont, Soc. anon. (anciennement Ateliers de J. J. Gilain). Fr. 778,274, Mar. 13, 1935. The seeds, etc., are caused to react under pressure with steam produced from the natural moisture contained in them. If the seeds are partly dried an amt. of water is added corresponding to that removed.

Extraction of oils. Hônen Seiyu K. K. (Mitsuo Nakamura, inventor). Japan. 109,730, Feb. 23, 1935. Addn. to 107,890. Oil-contg. material (such as soybean) is extd. with a mixt. of MeOH (or MeOH contg. a small amt. of EtOH) and chlorinated hydrocarbons (such as C₂HCl₃ or (CH₂Cl)₂). After extrn., the solvent is sepd. into 2 layers; the lower one contains pure oils, while the upper one (MeOH) contains impurities. The residue obtained by the process contains only a small amt. of impurities.

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Soaps

Edited by M. L. SHEELY

Germicidal Soaps. *Th. Ruemele Seifensieder-Ztg.*, 62, 361-2 (1935). A brief review—mainly of patents. (C. A. 29, 14, 4962, July 20, 1935.)

Selective Adsorption from Soap Solutions. Harvey A. Neville and Milton Harris, *Journal of Research of the National Bureau of Standards*, 14, 6, 771 (June, 1935.) Soap is adsorbed from aqueous solution at all types of interfaces, but the ratio of fatty acid to alkali in the adsorbed portion varies with the nature of the interface. Soap foam, continuously removed from an aqueous solution by CO₂-free air, was found to be less alkaline than the original solution, while the latter became progressively more alkaline.

The addition of alkalis to the soap solution decreased the selective effect and modified the character of the foam. When carbon black, paraffin oil, and pure olive oil were brought in contact with soap solutions, the aqueous medium became more alkaline and acid soap was adsorbed at the interface. Fuller's earth, olive oil containing free fatty acid, wool, and silk, in soap solutions adsorbed soap and alkali at the interface and the aqueous medium became more acid. Cotton showed no selective adsorption and adsorbed a relatively small amount of soap. The results of these experiments are consistent with the theory of the existence of an acid soap, resulting from the hydrolysis of soap in dilute solution.