ABSTRACTS

Oils and Fats

Edited by
M. M. PISKUR and RUTH LINDAHL

Difficultly bleachable palm oil. F. Wittka. *Allgem. Oel- u. Fett-Ztg.* **35**, 187-93 (1938).—Palm oil from the palm *Astrocaryum vulgaris* can not be bleached by blowing with air. Of the technically important palm oils those from Kongo are considered difficultly bleachable, and those from Kamerun and Zanzibar easily bleachable. The difficultly bleachable palm oils contained more linoleic acid than the easily bleachable oils. An indication of the bleachability of palm oil was obtained by detg. both I no. and (SCN) no., for these values indicating the amount of linoleic acid present. (*Chem. Abs.*)

The value and importance of some especially significant animal and plant products for fat and oil extraction as well as for the manufacture of feeds. O. Engels. *Allgem. Oel- u. Fett-Ztg.* **35**, 52-7, 98-102 (1938).—Byproduct feeds from the fat and oil rendering and extg. industries are described and discussed from a political economy viewpoint. (*Chem. Abs.*)

Color reactions of ketones and aldehydes with m-dinitrobenzol and their application for the detection of rancidity of fats and oils. I. Antener. *Mitt. Gebiete Lebensmittelunters. Hyg.* **28**, 305-7 (1937); C.Z. **1938**, (1), 3408.—Ketones and aldehydes give a bright red to violet color in the presence of m-dinitrobenzol + NaOH; the color is pure violet in excess of either ketones or aldehydes. In testing, 10 g. oil or fat is added to 125 cc. water and 30 cc. is distd. The distillate is tested by treatment with 2 cc. 2% m-dinitrobenzol soln. and 1 cc. of 10% NaOH soln.

A simple method for determining the fat content of poppy and other oil seeds. Fritz Werr. *Chem.-Ztg.* **62**, 367-8 (1938).—The amt. of oil in seeds of high oil content, i.e., poppy, rape, hemp and linseeds, can be detd. as follows: Grind 0.5 g. of seeds by rubbing in a mortar for 5 min. with twice their amt. of sea sand and some water-free Na_2SO_4. Place the ground mass in a suitable centrifuge glass and add 5 cc. of benzine (b.p. 80-90° C.). Stopper, shake for 3-5 min. and centrifuge at 3000 r.p.m. for 5-10 min. Transfer exactly 1 cc. of the clear soln. dropwise to a weighed filter paper during the course of 2½-3 min. while holding the paper 20 cm. above an electric hot plate. Temp. should be about 40° C. at that height. Allow the paper to hang on a hook in the balance room for 30 min. before weighing. The usual av. sp. gr. of each oil is used in the calcns. When using a definite wt. of sample and 0.92 or 0.93 as a practical sp. gr. for all fats the calcns. for oil content are simplified; or the procedure can be coordinated so that the final wt. of fat in mg. will be the same figure as the % fat in the original sample. The method is accurate enough and especially useful in plant breeding experiments. (*Chem. Abs.*)

Fatty acid derivatives of high molecular weight. G. M. Ford. *Iowa State Coll. J. Sci.* **12**, 121-2 (1937).—The lauric, myristic, palmitic, stearic, oleic deriv. of 18 organic compds. were prepd. and their m.p.'s listed. (*Chem. Abs.*)

Consistency lines of fats and elaidinized oils. J. Straub and R. N. M. A. Malotaux. *Rec. trav. chim.* **57**, 789-94 (1938).—A consistency line (I) for fats was described as any curve which expresses the relationship between the % solid components and the temp. The authors used calorimetric methods of analyses in which 2 Cal. of heat per min. were added to 3 g. of fat and the temp. noted each min., to obtain data for curves in which Cal. per g. were plotted against temp. These curves were called I. The I for coconut, palm, cacao, soybean, several hardened soybean, elaidinized olive and elaidinized rape oils and beef tallow were presented. The information from the I of various oils is of value in the margarine industry. As an example the information the curves show that coconut oil is almost all solid fat at 5° but at 26° it is wholly liquid; palm oil though partially liquid at 5° must be heated to over 40° to become wholly liquid. (*Chem. Abs.*)

Po-Yoak oil. Alph. Steger and J. van Loon. *Rec. trav. chim.* **57**, 620-8 (1938).—Po-Yoak oil is obtained from the seed kernels of *Parinarium sherbroense* of the Rosaceae family. The nuts (seeds), 9.5 g. av. wt., contained kernels of 5.5 g. av. wt. The oil content of the whole nuts was 26.4%. The oil soon solidified even when stoppered and in the dark. The first m.p. detn. gave 50-53°; on further storage the m.p. rose to 60-70°. Characteristics of the oil tested were: sp. gr. 78°/4° 0.9250, acid no. 1.35 sapon. no. 192.0, R-M no. 0.43, *n* 18/D 1.5209, *n* 46/D 1.5110, *n*. 70/D 1.5018, I no. (calcd. by hydrogenation) 207-208, (SCN) no. 76.1, diene no. (of oil extd. from ½ yr. old kernels) 60.0 and unsapon. 0.58%. Tests on the fat acids, i.e., fractional crystn. followed by elementary analysis, hydrogenation analysis, spectroscopic analysis and analysis of ozone oxidized products on the fractions indicated the presence of α- and β- eleostearic, and α- and β-coupeic acids. There was also present 12% satd. acids and 9-10% oleic acid. The properties of the oil relative to its use in the lacquer and varnish industries was intermediate between tung oil and oiticica oil. (*Chem. Abs.*)

What happens to cottonseed meats when they are rolled and cooked? R. G. Reeves and J. O. Beasley. *Cotton and Cotton Oil Press* **38**, No. 48, 3 (1937).—The meats were examd. under the microscope before entering the rollers, after rolling, after cooking and after pressing. Examn. of over 50,000 cells showed the following: rolling breaks the cells so that the oil may easily escape, cooking seps. the oil from each cell and makes it more fluid, facilitating its removal in the press. Cooking also causes the dark material in the resin glands to spread into the oil. (*Chem. Abs.*)

Reversible and irreversible changes in oil meal. A. M. Goldovskiĭ and G. P. Chistyakova. *Masloboĭno Zhirovoe Delo* **14**, No. 2, 7-8 (1938).—The reduction of the oil content from 12-15% in the press cake of crude flaxseed meal to that of 9.2-10.7% in the roasted cold-pressed and 6.72-8.04% in the roasted hot-pressed meal cakes shows that the pos. effect of roasting is

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the combined result of the thermally reversible and irreversible changes. (*Chem. Abs.*)

Detection of fish oil in linseed oil. Ernö Percs. *Ber. ungar. pharm. Ges.* **14**, 183-6 (1938).—Dissolve 3 drops of sample in 5 cc. acetone, add 0.05 g. Li_2CO_3, shake and add 10 cc. distd. water. Filter into a 100-cc. flask and fill to the mark. If the soln. is so clear that one can read letters through it then the oil contains less than 20% fish oil. The clupanodonic acid in fish oil forms an insol. suspension with lithium ions. Pure linseed oil contains 3-6% α-linolic acid the Li soap of which also gives some opalescence. Therefore, the reaction is not suited to quant. work, but is useful for rough estn. (*Chem. Abs.*)

Simple method for the separation of iso acids from hydrogenated fat. E. Ol'shevskaya and G. V. Pigulevskii. *Masloboino Zhirovoe Delo* **13**, No. 6, 27 (1937).—Promising results were obtained in the sepn. of iso acids in hydrogenated fat mixts. by pptg. satd. acids in MeOH with $Hg(OAc)_2$ and decompg. the Hg salts of the iso acids in the filtrate with HCl. The application of this reaction to the detn. of iso acids is being studied. (*Chem. Abs.*)

Determining the free alkali in colored wax emulsions. Karl Siegmund Nitsche. *Öle, Fette, Wachse, Seife, Kosmetik* **1938**, No. 6, 1-3.—Five to 10 g. of wax emulsion, i.e., leather dressing, shoe polish, etc., are heated with 50 cc. of water and some salt is added. After the soln. clarifies, it is filtered and the ppt. washed with salt soln. Carbonate alkali is detd. on the ext. by any of the methods in which CO_2 is liberated with HCl. In the presence of alkali hydroxides another salt soln. ext. is blown with CO_2 and the alkali carbonate is then detd. The alkali hydroxide is calcd. from the difference in the two detns. (*Chem. Abs.*)

Synthetic and fermentation glycerine. A. E. *Allgem. Oel- u. Fett-Ztg.* **35**, 62-6, 103-5 (1938).—Methods of prepg. glycerin, synthetically and by fermentation are reviewed. Twenty-three references. (*Chem. Abs.*)

The effect of excess administration of cod liver oil and its saponifiable fraction upon the metabolism; and consideration of toxic source of cod-liver oil. T. Tagaya. *Sei-i-kai Med. J.* **56**, No. 10, 1761-89.—The toxic symptoms produced in rabbit by daily injection of excess cod liver oil (10 cc. per kg. body wt. daily) can be produced by similar injections of saponifiable fraction of the oil, the effect being stronger with the latter. The toxicity of cod-liver oil is not due to vitamin A nor D, but is due to the saponifiable fraction. (*Chem. Abs.*)

The effect of proteins in the prevention of dietary fatty livers. H. J. Channon, J. V. Loach, P. A. Loizides, M. C. Manifold and G. Soliman. *Biochem. J.* **32**, 976-85.—All the proteins investigated have apparent lipotropic actions, in order of decreasing intensity—Gromax and whale muscle protein, caseinogen, albumin, beef muscle protein and edestin, fibrin and gliadin and, lastly, gelatin and zein. Albumin has been investigated in greater detail, and though of an activity similar to that of caseinogen at high levels, it consistently gives more fatty livers when fed at low levels. The influence of protein supplements on liver fat appears to depend on the amt. and nature of the basal protein. (*Chem. Abs.*)

PATENTS

Rotary-drum apparatus for disintegrating and drying animal materials such as fish offal, etc., to melt out grease. Wilhelm Steinmann. U. S. 2,118,421, May 24.—Various structural, mech. and operative details. (*Chem. Abs.*)

Preventing rancidity of fats. Jean Verne and Charles Mille. Fr. 820,124, Nov. 4, 1937.—Natural org. materials such as fats are protected against autoxidation and rancidity by admixing natural org. pigments of the general formula $C_{40}H_{56}$, or their derivs., isomers or oxygenated products, known by the general name "carotenoids." (*Chem. Abs.*)

Purifying fats, oils and waxes. N. V. de Bataafsche Petroleum Maatschappij. Brit. 478,930, Jan. 27, 1938. —Fats, etc., of the ester type are refined by extg. with an amine free from OH groups in the presence of H_2O. Fat acids, mucins, color and odoriferous constituents are removed. Thus, cacao butter is agitated at 30-100° with ethylenediamine, trimethylamine or cadaverine contg. equimol. amts. of H_2O or satd. with H_2O, the mixt. is centrifuged or distd. with steam and the recovered fat is washed and dried. (*Chem. Abs.*)

Apparatus for purifying oils. J. Stewart. British 477,717.—App. and method of heating oil in a steam deodorization process is described.

Refining vegetable oils, etc. N. V. de Bataafsche Petroleum Maatschappij. Fr. 822,176, Dec. 22, 1937. —Fatty oils, fats and waxes of the ester type are refined by extg. the impurities, amines optionally hydrated and contg. no OH groups being used as extn. solvents. Examples mention monohydrated ethylenediamine, monohydrated allylamine, benzylamine and trimethylamine. (*Chem. Abs.*)

Deodorizing and bleaching oils. L. C. Moore. U. S. 2,122,260.—App. for steam deodorizing of oils is described. The claims include heating each oil to a temp. which is below the critical temp. at which volatilization, polymerization or burning of oil occurs.

Art of refining edible oils, fats and analogous products. V. R. Kokatnur and O. S. Plantinga (to Autoxygen, Inc.). U. S. 2,121,545.—The refining process includes reacting material to be treated with organic peroxide at temps. less than 100° C. and in presence of a precipitant for mucilaginous material, said precipitant being of the type for which the peroxide acts as a catalyst in pptn.

Hydrogenation of oiticica oil and product therefrom. J. F. T. Berliner and C. Sly. U. S. 2,121,580.—Oiticica oil is hydrogenated to yield wax-like keto-

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glycerides with a wide range of m.p.s. depending on the degree of satn. allowed.

Hard fats. Buss Akt.-Ges. Fr. 820,184, Nov. 5, 1937.—Hard fats are obtained from vegetable and animal oils with a high fat acid content, especially those obtained by extn. with CS_2, by treatment with H at 200-300°. S, As and P are rendered volatile by this process and are eliminated from the oil by the current of H. The H is purified by passage through aq. solns. of basic substances such as alkali or alkali carbonates, and rinsed. (*Chem. Abs.*)

Catalyst manufacture. K. W. Coons (to Natl. Aniline & Chem. Co., Inc.). U. S. 2,120,958. For the ppn. of Ni catalyst, $NiCO_3$ is subjected to the action of H_2 at a pressure below atmospheric and temp. from 175° C. to about 500° C.

Purification of glycerol. G. W. Brant. (E. I. du Pont de Nemours & Co.). U. S. 2,120,227.—The removal of odor-forming constituents from glycerol which comprises maintaining glycerol in contact with an activated vegetable carbon for such a period of time that a 50% aq. soln. of filtered glycerol so contacted when heated to 75° C. with ½ its equiv. amt. of 0.5% soln. of H_2SO_4 will be substantially free from odor, the glycerol-carbon mass, having a pH value of less than 7, and separating the glycerol from the carbon.

ABSTRACTS

Soaps

Edited by **M. L. SHEELY**

pH of soap solutions. *Soap Perfumery and Cosmetics* 11 (6), 534 (1938).—Estimation of free alkali is one of the important operations in the soap industry. Many experts consider a certain excess of alkali to be essential to the stability of soaps. The titration values in alcohol will never be exact (after saponification during solution in alcohol, etc.), while the effects of the free alkali during the washing process will be much below the values derived from the "hydrolysed soap." Less than 0.5 per cent free alkali can scarcely be detected by a pH determination. On the other hand, the pH values of soap solutions range from 9 to 11.5, and are dependent upon the degree of hydrolysis. With increasing molecular weight of the fatty acid the degree of hydrolysis also increases. It is accordingly far more important to follow the reaction of the soap during the actual washing process. Davidsohn drew attention to this important point many years ago.

It will thus also be understood why, for example, modern shaving creams with a generous content of myristic acid act more mildly than soaps containing much stearin. From what has been said, coconut oil fatty acid, it is true, should be milder in action than stearic acid, but a reaction complex here comes into play. Lauric acid has a much more powerful wetting action, and thus degreases the skin to a greater extent. The irritant action of coconut soaps is due more to a strong degreasing effect than to a drastic alkaline action. Myristic acid here forms a compromise which, as in so many cases, gives the best results.

The fatty alcohol sulphonates, now so important for shampoos, degrease the hair more strongly than soap. This drawback is overcome by superfatting and by adding a little acid, which acts as an astringent. Acid is harmless to the hair. The isoelectric point of hair is at pH 5.8. Klöd gives the isoelectric point of degreased wool as 4.9. Since in the pH range of 5 to 6 only minute traces of acids are present, no damage is likely to follow treatment with acid. To reduce the action upon the hair to a minimum it is recommended that the acid baths for the hair be adjusted to near the isoelectric point. The absorptive power for alkalis is considerably greater. They swell the hair and are retained during washing. If followed by an acid bath, the alkali is neutralized and the hair acquires gloss and looseness.

New Jap fatty acid process. *Soap* 14, No. 7, 43 (1938).—Fatty acids which may be made into soap without the addition of tallow may be produced from fish oil at a cost warranting success as a commercial enterprise, according to an announcement by the Osaka Experimental Laboratory, Osaka, Japan, by a process invented by Dr. Gen Matsumoto of the Laboratory. The process is claimed to be an entirely new method. Its principal features are that the fish oil is first converted into glycerine and fatty acid; the latter further split by vacuum distillation into two groups, one with smaller molecules constituting 65 per cent of the total and the other containing the larger molecules accounting for 25 per cent. The former, when treated by a hydrogenation process, transforms into a fatty acid embodying all desirable properties of tallow and may be made into toilet soap, candles and similar articles. The other fraction may be used as a substitute for China wood-oil and other fast-drying paint bases, it is claimed.

Sulfur soap compound. *Soap* 14, No. 7, 62 (1938).—A new high-molecular weight, organic sulfur compound, classed as an "oil," is water- and alcohol-soluble, and is suitable for addition to soap to give it the usual characteristics of sulfur containing soap. It can be used in much smaller concentrations than inorganic sulfur and has no objectionable odor. For ordinary shampoos, from 7 to 12 parts are added to a liter of liquid, and for medicinal shampoos, from 12 to 20 parts to 1000 parts of liquid. In making sulfur soap, a completely neutral milled soap is used. Two per cent of the organic sulfur compound is well mixed into the soap a short time before it is pressed. Such a soap has unusual detergent action and is also therapeutically active on the skin. (*Ole, Fette, Wachse, Seife, Kosmetik.*)