☆ ☆ ☆ ABSTRACTS ☆ ☆ ☆

Oils and Fats

Edited by
M. M. PISKUR and MARIANNE KEATING

Future of world fatty material. J. C. A. Faure. *Oleagineux 3,* 453-7(1948). Lecture given at the International Assoc. of Seed Crushers.

History of oilseed processing. Warren H. Goss (Pillsbury Mills, Inc., Minneapolis, Minn.). *Oil Mill Gaz. 53,* No. 3, 16-21(1948).

Determination of moisture in lecithin and crude soybean oils. K. M. Brobst (A. E. Staley Mfg. Co., Decatur, Ill.). *Anal. Chem. 20,* 939-41 (1948). The Karl Fischer reagent has been employed in the development of an accurate and rapid method for the determination of moisture in lecithin. Difficulties presented by previous methods for this determination have been entirely eliminated. The precision has been found to be ± 0.4% of the water determined. The method is also applicable to related materials such as crude and refined corn and soybean oils.

Kahn employs new apparatus and method to turn out animal fat of bland type. A. E. Bailey (The Girdler Corp.). *Nat'l Provisioner 119,* No. 18, 10-11, 23(1948).

Preserving the quality of cottonseed in storage. Marion E. Whitten. *Oil Mill Gaz. 53,* No. 3, 13-16(1948). The effect of flash heating on storability of seeds was investigated. Cottonseeds of moisture 16.1, free fatty acids 0.4, and germination 52.0% dried by different processes and stored in 5-gal. cans, fitted with friction-type lids, yielded oils of the following free fatty acids after 112, 157, 187, 217, and 270 days, resp.: control-undried 6.2, 21.0, 28.5, 34.1, and 39.9%; air-dried at 175°F. for 6 mins. 1.5, 3.0, 9.0, 13.7, and 26.4%; air-dried at 225°F. for 6 mins. 1.4, 2.7, 6.0, 8.5, and 27.7%; air-dried at 450°F. for 1 min. 1.3, 2.8, 8.0, 19.3, and 42.5%; air-dried at 450°F. for 2 mins. 0.9, 1.4, 2.2, 3.0, and 31.8%; air-dried at 450°F. for 1 min. after preheating 0.9, 1.7, 5.0, 11.7, and 28.1%. The moisture in the seeds at the beginning of the test varied from 16.1% for the control down to 12.5% for the last test listed above. All samples after treatment had 0.0% germination. In another test, off-grade cottonseed of moisture 20.1 and free fatty acids 3.4 had moisture 10.7 and free fatty acids 18.5 after 6 months' storage in bins equipped with cooling system; samples of the same seeds heat-treated, stored 6 months in bins with cooling systems and in dead storage, resp.: had moisture 10.2, 10.4, and free fatty acids 4.5, 4.9%. The results indicate that flash heating and drying of cottonseed always store safely for 6 months if the seeds are in good condition when received. (*Chem. Abs.*)

The extraction of oil from cottonseed by pressing and solvent extraction methods. A. Cecil Wamble. *Oil Mill Gaz. 53,* No. 3, 31-4(1948). W. reviews the technic for efficient hydraulic oil-press operations, giving some suggestions which are equally applicable to expeller and solvent extn. operations. (*Chem. Abs.*)

Extraction of vegetable oils by selective solvents. C. Paquot and A. Najand. *Bull. soc. chim. France 1948,* 483-9. Selective solvents such as EtOH, MeOH, mixtures of EtOH-acetone, EtOH-EtOAc, petroleum ether-EtOAc, acetone-water, and furfural are used to extract cottonseed oil. For extraction of poppy-seed oil EtOH, furfural, or mixtures of acetone-water, EtOH with acetone or water or both are used. Contrary to what happens with cameline and soy oils, the extraction of cottonseed oil by selective solvents does not lead to considerable increase in I no., owing to a large percentage of unsaturated acids. The study of the extraction of poppy-seed oil by different solvents leads to the verification of a phenomenon seemingly not yet described in any other oil. With cameline or cottonseed oil, on mixing the oil and solvent and shaking, 2 layers are obtained after standing: one soluble in the solvent, having an I no. higher than that of the initial oil, and another insoluble fraction with an I no. less than the original oil. The opposite is obtained with poppy-seed oil: two layers are obtained, one insoluble in the solvent and having a higher I no. than that of the original oil, and another, soluble in the solvent, having an I no. less than that of the original oil. This extraction operation permits the evaluation of medium oils in extracting a fraction having drying properties very close to those of linseed oil (in the case of cameline oil and furfural). (*Chem. Abs. 42,* 5691.)

High vacua convention. *Chemistry & Industry Suppl. Oct. 1948,* 32 pp. Scientific aspects of vacuum technic, S. Dushman, 3-8S. Application of high vacua in the paint and plastics industries, J. C. Swallow and J. S. Gourlay, 9-13S. High vacuum dehydration and distillation, R. S. Morse, 13-19S. Vacuum metallurgy, R. A. Stauffer, 19-26S. The application of high vacuum distillation to the processing of triglyceride oils, E. W. M. Fawcett, 27-32S.

New Zealand fish oils. 5. Composition of the fats of the school shark *(Galeorhinus australis,* Macleay). A. P. Oliver and F. B. Shorland (Fats Res. Lab., Wellington, New Zealand). *Biochem. J. 43,* 18-24(1948). Studies of the distribution of oil in 8 specimens of school shark *(Galeorhinus australis)* showed that the liver, which varied in oil content from 23.1-60.7%, contained from 66.8-93.0% of the total oil reserves of the fish. Ester-fractionation analyses of 4 of the liver oils, and of the phosphatide and glyceride fractions of the combined head and body lipids, showed that the liver fatty acids contained a higher content of palmitic acid and of C_{18} unsaturated acids, but less stearic acid than the head and body lipids.

Dog fish *(Galeus canis)* liver oil. M. Cortelezzi. *Rev. Facult. ciencias quim. (La Plata) 21,* 19-29 (1948). During the year the data was % oil in liver 23.2-51.3, vitamin A in the oil 50,000-140,000 U.I./g., $d^{25/25}$ 0.9150-0.9278, n^{25} 1.4790-1.4885, ash 0.022-0.045, acid % 0.60-8.79, sapon. no. 171.5-184, ac no. 5.7-18.7, I. no. 160-183.7, insol. bromides % 62.5-67, R-M no. 0.81-1.89, Pol. no. 1.1-1.95, unsapon. % 1.35-4.68.

Investigations of some new Sudan seed oils. D. N. Grindley (Wellcome Chem. Lab., Sudan Med. Service, Khartoum). *J. Soc. Chem. Ind. 67,* 230-1

(1948). The seed oils of some members of the families Ulmaceae, Capparidaceae, Rhamnaceae, Tiliaceae, Euphorbiaceae, and Salvadoraceae, have been examined and their principal constants and compositions recorded. The results provide additional evidence for the close relationship between botanical similarity and seed fat constitution.

THE COMPONENT ACIDS OF RAPE SEED OIL. M. N. Baliga and T. P. Hilditch (The University, Liverpool). *J. Soc. Chem. Ind. 67,* 258-62(1948). The component acids of 4 rape seed oils—Indian (Toria, Guzerat), Polish (Danzig), Argentine (Plate), and of Ravison and Jamba—have been studied in detail. Appropriate conditions (crystallization from ether at —40°) for the preliminary separation of the mixed fatty acids prior to ester-fractionation have been selected which permit the approximate determination of the 3 unsaturated and 5 saturated minor component acids as well as of the 4 major components, erucic, oleic, linoleic, and linolenic acids. The average fatty acid composition of the 4 rape seed oil acids is palmitic 2.5, saturated C_{18}, C_{20}, C_{22}, and C_{24} (together) 5, hexadecenoic 2, oleic 15, linoleic 13.5, linolenic 8, eicosenoic 5, erucic 48, and docosadienoic 1% (wt.). Ravison oil fatty acids contain less erucic acid (39%) and more linoleic acid (21%). Jamba rape seed oil fatty acids contain less erucic acid (37.5%) and apparently larger proportions of oleic (c. 20%) and eicosenoic (c. 11%) acids.

THE COMPONENT ACIDS AND GLYCERIDES OF WHALE OIL. T. P. Hilditch and L. Maddison (The Univ., Liverpool Southern Oil Co., Ltd., Manchester). *J. Soc. Chem. Ind. 67,* 253-57(1948). The component acids of a specimen of Antarctic whale oil, previously separated by means of their lithium and lead salts prior to analysis by ester-fractionation, have now been resolved by the alternative process of crystallization from solvents at low temperatures. This method, which is preferred on account of speed and ease of operation, led to results in good agreement with those obtained earlier by the salt-separation procedure. When facilities for low-temperature work are not available, therefore, the preliminary separation by lithium and lead salts, although more lengthy, leads to data of similar accuracy. The component glycerides of the whale oil were reinvestigated by a more thorough segregation than that previously made by means of crystallization from acetone from —60° upwards, 6 groups of glycerides finally being obtained. The results were generally similar to those of the former study, but differed numerically in some respects: the oil contains about 16% of disaturated and 2.5% of trisaturated glycerides, about 30% of triunsaturated glycerides, and about 50% of glycerides containing one saturated acid, one unsaturated C_{18} acid, and one of the other homologous unsaturated acids. About 45% of the oil contains acids of the C_{20} and C_{22} series, and oleic groups are present in over 90% of the oil.

CANADIAN ERUCIC ACID OILS. I. REFINING AND BLEACHING. N. H. Grace. *Can. J. Res. 26F,* 349-59 (1948). Dark colored commercial erucic acid oils from rape seed, and from mustard seed screenings (*Brassica* species), have been subjected to various refining and bleaching treatments. Superfiltrol bleaching clay was superior to Neutrol clay or an unactivated Manitoba bentonite. Lecithin-free, partially alkali refined, and alkali refined oils were bleached readily by heating for 20 minutes at 100°C., as little as 2% clay yielding oils similar in color to commercial table oils. Crude oils could be bleached without preliminary refining treatment if the temperature were raised to 200°C., though some increase in free fatty acid occurred. With Stanolax as a color standard, relative transmissions at a wave length of 440 *mu* were 4.5% for crude rape seed oil, 5.0% for alkali refined rape seed oil, and 58, 78, and 91%, respectively, for the alkali refined oil bleached with 1, 2, and 4% Superfiltrol. The behavior of mustard seed oil was closely similar, though more bleaching clay was required. For both rape and mustard, spectrophotometric analyses indicated generally similar transmissions for crude, lecithin-free, and partially alkali refined oils in the range from 225-500 *mu*, while fully alkali refined oils showed reduced transmissions in the triene region (260-280 *mu*) with slightly increased transmission over the range from 320-500 *mu*. II. EDIBLE USE OF RAPE AND MUSTARD SEED OILS. H. J. Lips, N. H. Grace, and E. M. Hamilton. *Ibid.* 360-5. Canadian grown rape and mustard seed oils were alkali refined with 10° Bé. NaOH, bleached for 20 minutes at 212°F. with 2 or 4% Superfiltrol, and deodorized at 464°F. for 1 hour. These oils were lighter in color and more viscous than commercial corn oil, had smoke points over 400°F., and were clear at refrigerator temperature (40°F.). The fresh oils were generally not as satisfactory as corn oil for the preparation of doughnuts, although some of the aged oils gave results comparable with those for aged corn oil.

REFINING OF OIL WITH SOLVENTS. G. B. Martinenghi and G. Cardello. *Olearia 2,* 295-304(1948). The literature on the subject is reviewed, giving information on liquid-liquid extraction of fatty oil and petroleum.

PROCESS FOR CONTINUOUS DEACIDIFICATION OF OLIVE OIL BY MEANS OF ALCOHOL. J. M. M. Moreno. *Olii minerali grassi e saponi colori e vernici 25,* 45-7 (1948). This is the first of a series of articles describing the plant. This section contains a diagram of the plant and some descriptive information.

HIGHER YIELDS OF BETTER OILS BY CONTINUOUS ALKALI REFINING. L. D. Tyler (The Sharples Corp., Philadelphia). *Food Ind. 20,* 1456-9, 1561-2(1948). Part I. Centrifugal caustic soda method improves quality, cuts losses of batch system by separating more oil from soapstock and wash waters.

DETERMINATION OF THE IODINE VALUE. G. Reutenauer and M. Regent. *Oleagineux 3,* 379-83(1948). This is a Wijs method modified by the use of acetic acid as an accelerator of the reaction.

THE DETERMINATION OF LINOLEIC ACID IN EDIBLE FATS. W. J. Stainsby (British Food Mfg. Inds. Res. Assoc., London, N. 7). *Analyst 73,* 429-34(1948). A simple and time-saving method has been described for the determination of the composition of fats containing 2 unsaturated acids. The method is based on oxidation of the fat in anhydrous acetone with K permanganate followed by titration of the acidic glycerides after removal of the steam-volatile acid products. Results obtained with several types of oils compare very favorably with those obtained by the thiocyanogen and isomerization methods. The method can be extended with very little loss of accuracy to determine the total unsaturated acids of oils containing more than 2 unsaturated acids.

MECHANISM OF THE HYDROLYSIS OF THE TRIGLYCERides. C. Paquot and H. Richet. *Compt. rend. 226,* 925-7(1948). Hydrolysis may proceed by 2 possible paths, a direct hydrolysis, $(RCO_2)_3C_3H_5 + 3H_2O \rightarrow 3RCO_2H + C_3H_5(OH)_3$, or by the transitory formation of the di- and monoglycerides. The noncatalyzed hydrolysis of copra (I) and of palm (II) oils is studied at 200-75° in an autoclave, a homogeneous reaction system thus being present at all time. The hydrolysis of I at 200-50° with 20% by weight H_2O is followed by the acid and HO indices of the oily phase and by per cent glycerol (III) in the aqueous phase. All samples are immediately cooled to room temperature after withdrawal from the autoclave. Equilibrium is reached in 150 minutes at 270°, giving 61.3% fatty acid. The oily phase contains di- and monoglycerides. Liberation of III is at first very slow. Refined II is hydrolyzed at 275° with 15% by weight H_2O. The equilibrium concentration of fatty acid is 65.8%. Evidence favors the noncatalyzed stepwise hydrolysis of triglycerides. (*Chem. Abs. 42,* 5420.)

Ethyl esters of higher fat acids. J. Mikumo. *J. Soc. Chem. Ind. Japan 46,* 985-6(1943). The acids obtained from sardine oil and coconut oil, respectively, were esterified by means of 20, 30, and 93% alcohol to the extent of 90% at 95° in the presence of about 5% of 95% H_2SO_4. The degree of esterification can be raised to 95-8% and 94-6%, respectively, when 10-20% anhydrous $Al_2(SO_4)_3$ is added to the reaction mixture at 90° in the presence of 3% H_2SO_4. (*Chem. Abs. 42,* 6316.)

A synthesis of cis-11-octadecenoic and trans-11-octadecenoic (vaccenic) acids. K. Ahmad, F. Merlin Bumpus, and F. M. Strong (Univ. Wisconsin, Madison). *J. Am. Chem. Soc. 70,* 3391-4(1948).

Influence of fat nutrition on growth, fertility, and longevity of rats. II. B. v. Euler, H. v. Euler, and I. Ronnestam-Saberg (Univ. Stockholm). *Arkiv Kemi, Mineral. Geol. 24A,* No. 15, 9 pp. The growth and reproduction of rats maintained on 3 different diets were observed over a period of 3 years. One group was fed a diet containing 100 g. casein, 250 g. wheat starch, 25 g. salt mixture, 200 g. yeast, 60 g. butter fat, orange juice, and 50 mg. KI, in addition to weekly supplements of vitamins A and D. The second group received the identical diet except that fortified Swedish margarine was substituted for butter fat. The third group received stock diet. α-Tocopherol (350 γ) was added weekly to the experimental diets after 12 months. The observations gave no indication for the existence of any essential nutritional differences between butter and the margarine fat mixtures. Gross and histological post-mortem data were reported on rats which died at an age exceeding 500 days. III. *Ibid. No.* 20, 22 pp. (1947). Butter and vitamin A-fortified margarine were compared with respect to their influence on body weight, longevity, cause of death, fertility, and ability to nourish young in rats throughout their life span. Growth and fertility in their offspring were followed until the 5th generation. Margarine was in no way inferior to butter. Weekly additions of 500 γ vitamin E to the experimental diets induced no increased growth rate in the 1st generation. The principal causes of death in old rats, whether reared on stock or experimental diets, were pneumonia and kidney dysfunction. The liver and heart often exhibited pathological changes; calcareous deposits occurred in the kidneys, heart, and lungs. (*Chem. Abs. 42,* 6427.)

Effect of galactose on the utilization of fat. C. P. Richter (Johns Hopkins Med. School, Baltimore). *Science 108,* 449-50(1948), These experiments with oleo were started during the war, when butter was not available in adequate amounts. Butter would have been a better fat with which to start; still better would have been a fat that does not contain even the very small amount of protein, milk solids, and vitamins that are present in oleo. Preliminary experiments with corn oil and galactose have thus far given essentially the same results. The results show that fat apparently does not have any effect on the utilization of galactose.

Effect of wartime feeds on fat content of cow milk. K. Breirem. *Meieriposten 33,* 464-71, 489-94 (1944). In the spring of 1944 change from stall-feeding to pasture caused a marked rise in the fat content of milk handled by a typical Ostland (Denmark) dairy but a slight fall in that of the milk produced at the College of Agriculture. During 3 years of war, the average fat percentage of the college milk rose from a prewar average of 3.91 to a maximum of 4.24; the average yield fell from 3885 to 2795 kg. Although there was a general reduction in the hay and concentrate rations of cows during the war years, fodder cellulose was used on the college farm as a replacement ration and constituted one-third of the total winter feed during the 1942-3 season. Feeding trials, in which standard rations were compared with those containing cellulose and fish meal, showed that cellulose promoted a rise in the fat percentage with a fall in the milk yield. When hydrolyzed straw replaced cellulose, the fat percentage did not rise. The reduced fat content of the Ostland winter milk was probably caused by a general lack of nutrients, protein deficiency, and increase in spring calvings, independently or conjointly. The increase in spring calvings with a consequent initial increase in milk yields or decreased fat content was avoided on the college farm. (*Chem. Abs. 42,* 5575.)

The effect of α-tocopherol on the utilization of carotene by the rat. R. M. Johnson and C. A. Baumann (Univ. Wisconsin, Madison). *J. Biol. Chem. 175,* 811-16(1948). α-Tocopherol did not interfere with the storage of vitamin A when the vitamin itself was fed, but the stores of vitamin A due to β-carotene were lowered significantly when 5 or 10 mg. of α-tocopherol were fed with the carotene. Tocopherol injected intraperitoneally also appeared to interfere somewhat with the utilization of ingested carotene. Tocopherol fed 8 hours after the carotene failed to interfere with the storage of vitamin A.

Drying Oils

Edited by
ROBERT E. BEAL

Lallemantia oil. I. Kaufmann (Farbe und Lack, Feb., 1948). *Paint, Varnish Production Mgr. 28,* 309-10(1948). The oil is obtained from the seeds of *Lallemantia Iberica,* a low-growing annual. The seeds contain 24-38% of a drying oil (saponification no. 188.7, iodine no. 179.4, refractive index 1.4802) equal to linseed oil for paints and varnishes. The fatty acid composition is linolenic 35.1, linoleic 24.8, oleic 19.7, oxy-acids 6.7, saturated acids 8.4.

CONJUGATED OILS. PART 4. PRODUCTION OF ARTIFICIALLY CONJUGATED OILS AND FATTY ACIDS. F. Armitage and J. A. Cottrell. *Paint Technol. 13,* 353-6 (1948). Methods of producing conjugated oils by alkali isomerization, neutral isomerization with silicates, activated earths, and nickel-carbon catalysts, and isomerization by dehydration of naturally occurring or synthesized hydroxylated compounds are reviewed. Ultraviolet absorption measurements provide the only reliable method for measuring conjugation, although the maleic anhydride and other reactions may furnish valuable information.

CONDENSATION OF PHENOL WITH DRYING OILS. P. A. Doshi and T. N. Mehta (University of Bombay, Bombay, India). *Paint Manuf. 18,* 322-4(1948). Condensation products from the reaction of phenol with linseed oil, and linseed oil methyl esters in the presence of several acidic catalysts, were analyzed for saponification value, iodine value, acid value, and acid value of the derived fatty acids. Oxalic acid, concentrated H_2SO_4, and P_2O_5 (each in 3% concentration) cause phenol to react at the ethylenic double bonds of the fatty acid at 250° (6 hours), while at 100° H_2SO_4 is as effective as at 250° but P_2O_5 is ineffective and gaseous HCl promotes interesterification. About 10% of phenol is condensed with oxalic acid present while with H_2SO_4 and P_2O_5 present 14% condensation is produced.

PRESENT USAGE OF TALL OIL IN THE PAINT INDUSTRY. L. L. Mann (American Paint Journal Co.). *Am. Paint J. 33,* No. 3, 66-7, 70, 72, 74, 78, 80, 82(1948). A survey of paint, varnish, and resin manufacturers indicated that an improvement in the color and odor of tall oil is desired by a majority of users.

THE MECHANISM OF ISOMERIZATIONS OF UNSATURATED FATTY ACIDS BY SULFUR DIOXIDE. J. H. deBoer, J. P. W. Houtman, and H. I. Waterman (Univ. Delft, Holland). *Koninkl, Nederland, Akad. Wetenschap, Proc. 50,* 1181-8(1948). Polymerization of linseed oil and of linoleic and linolenic esters having two double bonds separated by CH_3, with SO_2, is preceded by a double-bond shift to form a conjugated system. The reaction is believed to proceed by the formation of a biradical through the addition of SO_2 to one of the double-bonded C atoms followed by intermolecular rearrangement and splitting off of SO_2 to form the conjugated system. (*Chem. Abs. 42,* 6547.)

LALLEMANTIA OIL AS A SUBSTITUTE FOR LINSEED OIL. E. Bergner. *Farbe u. Lack 1947,* 25. Substitution of the oil for wood oil in a colophony varnish resulted in an inferior varnish. Replacement of linseed oil with lallemantia oil in an outside varnish, imparted stability to the varnish as evidenced by a lack of oxidation of metal plates coated therewith and exposed outdoors for five years. Similar plates coated with a linseed oil varnish and likewise exposed became rusted. (*Chem. Abs. 42,* 7064.)

THE PRODUCTION OF DRYING OILS BY THE CHLORINATION AND DEHYDROCHLORINATION OF HIGH-MOLECULAR-WEIGHT HYDROCARBONS. L. K. Beach (Purdue Univ., Lafayette, Ind.). *Univ. Microfilms* (Ann Arbor, Mich.), *Pub. No. 847,* 162 pp. (*Chem. Abs. 42,* 6132.)

DRYING OIL FROM COTTONSEED OIL. G. L. Yukhnovskii. *Trudy Khar'kov. Khrm.-Teknol. Inst. im. S. M. Kirova No. 4,* 88-102(1944). Refined cottonseed oil is oxidized at 150° (optimum), with 80-100 liters of air/hr./kilogram of oil in the presence of Pb-Mn resinate for 4 hours, and subsequently dehydrated in the presence of 3% Al_2O_3 and 2% fine Zn filings for 4 hrs. at 280-90° to produce a drying oil. Longer oxidation at a higher air flow gives a darker oil as does more prolonged dehydration. Oxidation products of 79 and 145 acetyl numbers gave drying oils of equal quality. If the dehydrated oil is esterified with 2-4% of glycerol at 220-60° to lower the acid number, drying velocity is improved by about 20%. The oil dries in about 20 hours. Other oxidation and dehydration catalysts are discussed. (*Chem. Abs. 42,* 6132.)

AUSTRALIAN RESEARCH IN THE USE OF SAFFLOWER OIL. C. MacMillan. *Peintures, pigments, vernis 24,* 110-13(1948). Australian safflower oil (iodine no. 145, sapon. no. 192, linoleic 70%, oleic 15-25%, saturated acids 5-10%) dries more slowly than linseed oil in the absence of driers but faster than linseed when driers are used. The oil is non-yellowing, bodies to a maximum in the same time as linseed oil, and forms a clearer varnish with alkyd or phenolic resins. Varnish films are softer than linseed varnish films but of comparable water and alkali resistance. (*Chem. Abs. 42,* 6546.)

RUBBER SEED OIL. G. Mantin. *Rubber Developments 1,* No. 2, 6-7(1947). Heating rubber seeds for 1 minute at 100° soon after collection prevents their deterioration to produce an inferior drying oil. Preliminary tests indicate that the drying oil has good drying properties. (*Chem. Abs. 42,* 6563.)

PATENTS

PROCESS OF MAKING SULFURIZED JOJOBA OIL. F. B. Wells (Ellis-Foster Co.). *U. S. 2,450,403.* The oil is heated and 31% of sulfur added gradually as the temperature increases from 250-400°F. Heating is continued at 350-400°F. for about 20 minutes until the product is liquid when cold.

MODIFIED DRYING AND SEMIDRYING OILS AND VARNISH OILS. Raybestos-Manhattan, Inc. and A. H. Stevens. *Brit. 577,202.* A mechanically refined, nonconjugated drying oil having an ash content of less than 0.01% is treated with an O containing gas at 25-70 until it becomes soluble in synthetic resins at room temperature but not until it has lost its fluidity, to form a conjugated drying oil. (*Chem. Abs. 42,* 5688.)

DRYING AND BODIED OILS FROM MARINE ANIMAL OILS. E. W. Eckey (Proctor and Gamble Co.). *U. S. 2,442, 533.* Unsaturated triglycerides separated during catalyzed molecular rearrangement of marine animal oils are suitable as drying oils. The oils do not form "polyaur clouds" during heat polymerization. (*Chem. Abs. 42,* 5688.)

Soap

Edited by
LENORE PETCHAFT

SOAP-MAKING BY THE COLD PROCESS. Reginald Child. *Trop. Agr.* (Ceylon) *102,* 232-7(1946). Equipment, methods, and several formulas are given for producing soap by a process in which there is no separation of glycerol from the product. (*Chem. Abs. 42,* 8000.)

SPECIALTY SOAP LINES. Paul I. Smith. *Soap Sanit. Chemicals 24,* No. 10, 41-2, 159(1948). Information on making such specialty products as scouring powders and soap, abrasive hand cleaners, dishwashing compounds, glass polish cleaners, detergent briquettes, and cement cleaners is given.

THE EFFECT OF BUILDERS IN HARD WATER DETERGENT SOLUTIONS. Muriel W. Foster, Jessie S. Roberts, and Jessie B. Brodie. *Can. J. Research 26F,* 76-85(1948). The effect of Na_2CO_3 (I), Na_3PO_4 (II), Na_2SiO_3 (III), $Na_4P_2O_7$ (IV), and Na hexametaphosphate (V) in H_2O of 300 p.p.m. $CaCO_3$ equivalent hardness was studied. Each showed great H_2O-softening power; the minimum concentration required for maximum softening varied from 0.30 g./100 ml. for V to 2.75 g./100 ml. for I. Residual hardness from maximum softening varied from 1 p.p.m. for IV to 15 p.p.m. for II. For soil-removal studies, the builders were used with 0.5% soap. All except V were inferior to 0.5%soap in hard H_2O. V was superior to soap alone in hard H_2O and equivalent to soap in soft H_2O. Addition of soap with or after the builder gave the same effect. Deposition of insoluble compounds varied with the manner of softening. I. II. and III, which precipitate hardness, deposited more than soap alone, while V, which forms soluble complexes, deposited less than soap. The builders caused no chemical degradation during 10 washings. (*Chem. Abs. 42,* 7554.)

THE POLAROGRAPHIC ESTIMATION OF THE TOTAL AMOUNT OF FAT IN SOAPS AND SOAP POWDERS. S. Fiala and V. Jancik. *Collection Czechoslov. Chem. Communs. 13,* 30-6(1948) (in English). The method depends on the precipitation of Cd from a standard solution by neutral soaps and on the polarographic determination of the resulting diminution of the Cd wave. For evaluation of the results, the neutralization number of the fatty acids in the soap must also be determined, since the quantity of Cd reacting with the soap depends on it. Detailed directions for the procedure for soaps and soap powders are given. Good agreement is found between the polarographic method and an extraction method with soaps containing 0.3-80% fat and with neutralization numbers varying from 198 to 231. (*Chem. Abs. 42,* 8000.)

DETERMINATION OF FATTY ACIDS BY MEANS OF ALCOHOL IN SOAPS AND THE LIKE. K. Braun. *Seifensieder-Ztg. 73,* 605(1947); *Chimie & Industrie 59,* 65(1948). For liquid or pasty soaps, to a 20-g. sample add a little water and concentrated HCl to dissociate the sample, evaporate to dryness on the water bath, take up in alcohol, filter, evaporate the alcohol, dry the fatty acids at low temperature, and weigh. The soap must contain no alcohol-soluble filler. (*Chem. Abs. 42,* 7553.)

TESTING OF COLLOIDAL SOLUTIONS BY DYE SOLUBILIZATION. Joseph M. Lambert and Warren F. Busse (General Aniline & Film Corp., Easton, Pa.). *J. Chem. Phys. 16,* 847-8(1948). McBain *et al.* studied dye solubilization in connection with the structure of colloidal micelles. Their procedure is tedious, since it requires the attainment of equilibrium conditions in days or weeks. It was found that values sufficiently close to equilibrium values could be obtained in 15 minutes at 50° with water-insoluble azo dyestuffs. For each test, 100 mg. crystalline 1-*o*-tolyazo-2-naphthol was mixed with 20 ml. of solutions of detergents, wetting agents, and a hydrotopic agent (0.1-300 g./l.), maintained at 50° for 15 minutes, filtered, and the amount of solubilized dye determined with an electrophotometer. Solubilization isotherms are given for Igepon TD, Nacconol NR, Aerosol MA, Nekal NS, and Na xylenesulfonate. The general equation for the isotherm is $S = Kc^n$, where S is the amount of dye solubilized (mg./100 ml. of solution), c is the concentration of detergent solution (g./l. of active ingredient), and K and n are constants characteristic of each solubilizing agent. (Chem. Abs. *42,* 7603.)

SKIN DETERGENTS. H. Czetsch-Lindenwald (Forschungslab. Pan-Chemie Wolfsberg, Sachendorf). *Mitt. chem. Forsch. Inst. Ind. Osterr. 2,* 3-7(1948). Although the new synthetic detergents have excellent cleansing properties, soap is better for use on the body. Soap not only cleanses, but also lubricates the skin, probably by depositing a unimolecular film of free fatty acid. (*Chem. Abs. 42,* 7494.)

SYNTHETIC DETERGENTS IN RAYON TEXTILE PROGRESS. Anon. *Rayon Synthetic Textiles 29,* No. 11, 89-92 (1948). General review article outlining growth of use of synthetics in textile processing. Various types and chemical groups of detergents are described with emphasis on specific applications of anionic, cationic, and non-ionic detergents in rayon processing.

THE DEVELOPMENT OF SYNTHETIC DETERGENTS AND FUTURE TRENDS. F. H. Braybrook. *Chemistry & Industry 1948,* 404-7, 409-10. The development of the soap and synthetic-detergent industries is reviewed. U. S. production figures for the latter are given for the years 1940-47 and estimated at 325,000 tons by 1952 for 100% active material. The situation in German-controlled prewar Europe is reviewed. The increased demand for edible fats on a world-wide basis is foreseen; this would cause the supply for soap manufacturers to continue short for many years to come. The use of synthetics as replacement is anticipated. (*Chem. Abs. 42,* 7553.)

FUNDAMENTAL CONSIDERATIONS OF SURFACE CHEMISTRY APPLIED TO THE PROBLEM OF DETERGENCY. E. K. Rideal. *Chemistry & Industry 1948,* 403, 409. Detergency is defined through a consideration of the soiled fabric and the nature of the fabric. The forces operative in the retention and the mechanism of removal of particulate and molecular matter from various types of fibers are reviewed. (*Chem. Abs. 42,* 7553.)

PATENTS

CONTINUOUS MANUFACTURE OF SOAP. Ronald Vincent Owen (Joseph Crosfield & Sons). *British 605, 995.* Continuous manufacture of soap in which there is a short initial agitation of the fat and suitable saponifying agent in order to promote an emulsion between them, followed by a period when agitation is not allowed to interfere with the self-saponification of most of the remaining fat and, finally, a period of further agitation to complete the saponification of any residual fat.

SOAP FROM SPERM OIL. Arthur Abbey. British *603,529.* Continuous process of soap production from sperm oil by continuously supplying preheated sperm oil and molten anhydrous alkali, each separately, to a vessel and there mixing the oil and alkali, removing the air from the vessel by steam pressure, and using the heat generated in saponifying the fatty acid esters to transform the fatty alcohols into fatty acid soap which is continuously withdrawn from the vessel.

SPECIAL SOAP. *Societe des establisements agent. French 860,927.* Equal parts by weight of dry calcium carbonate, soda ash, and oleate soap are mixed and dissolved in water, after which 0.5% of aluminum acetate is added, based on the solids content. (*Soap 24,* No. 10, 95, 1948.)