If very small amounts of sodium bicarbonate are present the test should be compared with a blank run in the same manner but omitting addition of the sample.

Experience with the method will enable one to estimate the amount of bicarbonate present.

Experimental and Discussion

Some loss of bicarbonate was anticipated during the preparation of the alcohol-insoluble material prior to making the test. To determine the magnitude of the loss, 1-gram portions of a mixture of sodium carbonate and sodium bicarbonate were heated in 100 ml. volumes of boiling ethyl alcohol for periods varying from 30 minutes to 3 hours, filtered, and titrated to phenolphthalein and methyl orange. The sodium carbonate content increased slightly and the sodium bicarbonate content decreased somewhat more rapidly. The values have been plotted and are shown in Figure 1. The original mixture contained 58.20% of sodium carbonate and 35.32% of sodium bicarbonate. Inspection of the plot indicates that unless the sample is kept in contact with ethyl alcohol at the boiling point for an excessive length of time, the loss of bicarbonate ion is not sufficiently serious to vitiate the test.

Unknowns were prepared by adding sodium bicarbonate in increasing amounts to a mixture of equal parts of sodium carbonate, pyrophosphate and silicate. In each case, the mixtures were treated with hot ethyl alcohol as in the determination of alcohol-insoluble. As a result of experimental work with the unknowns, it appears that the limit of sensitivity is about 0.1 gram of sodium bicarbonate in the presence of 1 gram of the mixture of carbonate, pyrophosphate and silicate. Using 5 grams of sample for the test about 0.02 gram of sodium bicarbonate can be detected. This is the extreme limit of sensitivity of the test.

The presence of trisodium phosphate does not affect the sensitivity of the test. Sodium tetraborate (borax) produces a positive reaction if present in large amounts. If the test is run on borax by itself, the amount of bromine liberated is roughly equivalent to that encountered when working at or close to the limits of sensitivity of the test. Thus, unless very large amounts of borax are present, the indications of the test are still valid. "Calgon" ($Na_6P_6O_{18}$) interferes seriously with the test. Sodium perborate and trisodium phosphate do not interfere.

The presence of wetting agents and sodium sulfate likewise do not influence the test. Care must be taken, however, in the presence of wetting agents not to shake the contents of the funnel too vigorously, otherwise the carbon tetrachloride will emulsify.

A series of soap samples which were known to contain sodium bicarbonate by the carbon dioxide evolution method (3) gave positive results when tested in accordance with the above described procedure.

Acknowledgments

The authors wish to express their appreciation of the assistance of Miss Randall, technical librarian, in the preparation of this paper. Mr. John Monick of the engineering staff kindly drew the solubility plot.

LITERATURE CITED

(1) Mellor, "Modern Inorganic Chemistry," 8th Edition, p. 810, Longmans, Green & Co., New York (1933). The test is due to Perkin, J. Soc. Chem. Ind. *21*, 1375 (1902).

(2) Official and Tentative Methods of the American Oil Chemists' Society, p. A-4 (1940).

(3) Blank and Boggie, Oil & Soap *20*, 125 (1943).

Abstracts

Oils and Fats

Edited by
M. M. PISKUR and SARAH HICKS

DETECTION OF OLIVE OIL IN EDIBLE OIL MIXTURES. J. Fitelson. *J. Assoc. Off. Agr. Chem. 26,* 499-506 (1943). A simple method of detg. the "squalene" content is proposed as an aid in the detection of olive oil in mixt. of the common, edible, vegetable oils. The squalene is concd. in a fraction obtained by the selective adsorption treatment of the unsaponifiable matter. The unadsorbed residues from olive oil consist almost entirely of squalene and the unsatd. material in the much smaller residues from other oils consists largely of squalene. The unsatn. of these residues is assumed to be due to squalene, and the quantity of this hydrocarbon present in oils is calculated from the total halogen absorption. The results obtained by this method show good reproducibility. Although all of the vegetable oils examined contained squalene, olive oil is characterized by its much higher squalene content. However, the wide range found in olive oil, together with the small quantites of squalene present in other oils must be considered in applying the proposed method.

A SIMPLE SEMIMICRO APPARATUS FOR THE KINETICS OF HYDROGENATIONS. P. Hersch and J. Degmer. *Rev. faculte sci. univ. Istanbul 7,* No. 1-2, 88-97 (1942). The app. permits establishing the rate of hydrogenation within 4-5 min. The stirring rate is const., the results are reproducible and comparable for different catalysts. The absorption reaches its max. within the 1st and 2nd min. *(Chem. Abs.)*

UNSATURATED SYNTHETIC GLYCERIDES. I. UNSYMMETRICAL MONOÖLEO-DISATURATED TRIGLYCERIDES. B. F. Daubert, H. H. Fricke, and H. E. Longnecker. *J. Am. Chem. Soc. 65,* 2142-4 (1943). Data are reported for a series of monoöleodisaturated triglycerides, 1-oleo-2,3-dicaprin, 1-oleo-2,3-dilaurin, 1-oleo-2,3-dimyristin, 1-oleo-2,3-dipalmitin, and 1-oleo-2,3-distearin. UNSATURATED SYNTHETIC GLYCERIDES. II. UNSYMMETRICAL DIOLEO-MONOSATURATED TRIGLYCERIDES. B. F. Daubert, C. J. Spiegl, and H. E. Longnecker. *Ibid.,* 2144-5. The melting points of the unsymmetrical dioleo-monosaturated triglycerides increase with increasing length of the carbon chain of the saturated fatty acid. The av. change in refractive index with change in temp. (dn/dt) for the compds. prepd. is 0.00037. Hydrogenation of the dioleo-monosaturated triglycerides gave 1-acyl-2,3-distearins comparable of those prepd. previously by other methods.

THE INFLUENCE OF PREVIOUS DIET ON THE PREFERENTIAL UTILIZATION OF FOODSTUFFS. I. FASTING KETOSIS AND NITROGEN EXCRETION AS RELATED TO THE

FAT CONTENT OF THE PRECEDING DIET. S. Roberts and L. T. Samuels. *J. Biol. Chem. 151*, 267-71 (1943). Adult male rats forcibly fed a high fat diet for 3 to 6 weeks exhibited a significant early fasting ketosis. This was absent in animals similarly treated but fed a high carbohydrate diet. Protein intake and nitrogen excretion during fasting were the same in both groups. The ketosis was evidenced by high levels of blood and urinary acetone bodies and large, grossly fatty livers in the fat-fed animals. Evidence is presented that fasting ketosis is a reflection of accelerated fat metabolism initiated during feeding and continuing after the withdrawal of food. This is the phenomenon of preferential utilization.

THE OCCURRENCE OF SQUALENE IN NATURAL FATS. J. Fitelson. *J. Assoc. Off. Agr. Chem. 26*, 506-11 (1943). The squalene content of 23 fats was detd., and the results range from none in cocoa butter to a maximum of 708 mg. per 100 grams in one sample of olive oil. With the exception of cocoa butter, these fats were further examined, and the typical squalene hexahydrochloride crystals were obtained from all. The fats thus examined included 16 vegetables, 2 marine animal fats, and 4 land animal fats. Although most of these fats contain very small quantities of squalene, the currently held conception that the occurrence of this hydrocarbon is limited to a few fats, mainly those from certain marine animals, must now be modified.

THE USE OF BENTONITE AS A GEL-PRODUCING MEDIUM AND CARRIER. A. Esme. *Industrie Chimique 28*, 230-1 (1941). Bentonite swells in water and can absorb 25-30 times its original vol. Therefore, it is suitable as a basis for the prepn. of emulsions of all kinds, particularly as a substitute for fatty carriers. The tendency of these gels to dry easily can be greatly reduced by the addn. of glycerol or glycol, sugar solns., and solns. of Zn or Mn nitrate or $CaCl_2$. *(Chem. Abs.)*

LIPOTROPIC ACTION OF INOSITOL. J. C. Forbes. *Proc. Soc. Biol. Med. 54*, 89-90 (1943). The lipotropic action of inositol in the presence of other members of the vitamin B-complex has been confirmed. The effect of inositol plus choline is considerably greater than that of either alone.

FAT ACIDS WITH ODD NUMBER OF CARBON ATOMS. V. THE BEHAVIOR OF BRANCHED FAT ACIDS IN THE BODY. W. Keil. *Z. Physiol. Chem. 276*, 26-32 (1942). The feeding to dogs of triglycerides of branched fat acids with even or odd nos. of C atoms causes an increase in the amt. of acid metabolic products in the urine. *(Chem. Abs.)*

FAT FROM FATTY ACIDS WITH ODD NUMBERS OF CARBON ATOMS. H. Appel, H. Bohm, W. Keil, and G. Schiller. *Z. Physiol. Chem. 274*, 186-205 (1942). Growth and development of young male goats were the same when fed coconut oil or butter fat or a synthetic fat mixt. (1) consisting of straight chain odd- and even-numbered fatty acids. After prolonged feeding the resorption of I was 79%, of coconut oil 91%, and of butterfat 92%. Body and depot fat of rats and goats fed satd. fats contained more than 60% satd. acids. Feeding I contg. 1_{10}—C_{22} fatty acids led to C_{13}—C_{17} fatty acids in depot fat, and odd numbered C-chain fatty acids amounted to 33% of the total depot fatty acids. With I, C_{13} acids are the smallest to appear in depot fat, with coconut oil C_{12}, and with butterfat C_{14}. *(Chem. Abs.)*

PATENTS

CONTINUOUS SOLVENT RECOVERY APPARATUS. A. A. Levine, O. R. Sweeney, C. E. Kircher, Jr., and W. L. McCracken (E. I. du Pont de Nemours & Company). *U. S. 2,334,015.*

EXPELLER PRESS. R. T. Anderson (V. D. Anderson Company). *U. S. 2,331,883.* The present invention has for its object to provide a novel organization of and relation between preliminary press, feed hopper, feed press, and main press elements, or two or more thereof, each thereof being so constructed and arranged, and all being so related to each other, as to materially improve the operation of the press as a whole, and in particular to increase its efficiency, to reduce wear and tear and breakage of the parts, and lengthen its period of usefulness.

PRESSURE-COOKER DISCHARGE DEVISE (FOR ANIMAL OR VEGETABLE OIL BEARING MATERIALS). A. P. Holly (The V. D. Anderson Company). *U. S. 2,331,910.*

OIL EXTRACTION. F. B. Lachle (The Schwarz Engineering Company). *U. S. 2,331,785.* An oil extn. process for cellular oil-bearing materials having gelatinous constituents includes the steps of first subjecting the material to an aq. soln. to dissolve out the gelatinous constituents then sepg. out the gelatinous constituents to provide a gel-free oil-bearing residue, and thereafter reducing such residue to substantially cellular form in an aq. soln. and liberating the oil from the individual oil cells by application of a point pressure effect of the type provided by a ball mill.

PLASTIC SHORTENING MIX. E. L. Griffith (The Grifith Laboratories). *U. S. 2,332,074.* A stable plastic shortening fat mix comprises about equal parts by wt. of a shortening fat melting at 115° to 120° F. and a hydrogenated vegetable oil melting at 140° to 160° F., and dispersed therein dry disrupted starch grains.

FRACTIONAL DISTILLATION. E. W. Eckey (The Procter & Gamble Co.). *U. S. 2,333,712.*

STABILIZATION OF FAT-SOLUBLE VITAMINS. E. J. Simons and L. O. Buxton (National Oil Products Company). *U. S. 2,331,432.* A vitamin A antioxidant comprises acetyl methyl carbinol as the active constituent.

ANTIOXIDANT FOR FATS AND OILS. H. A. Mattill and C. Golumbic (Lever Brothers Company). *U. S. 2,333,655.* A plastic, dry, edible shortening formed from hydrogenated vegetable oil, contains a small amt. of an ascorbic acid and a tocopherol, said combination producing a synergistic action of inhibiting oxidation and the development of rancidity in said shortening.

FOOD PRODUCT AND METHOD OF MAKING. W. J. Fitzpatrick and H. H. Wagner (The W. J. Fitzpatrick Company). *U. S. 2,334,401.* The method of prepg. a lecithinated baking ingredient in the form of a dry granular mass which comprises forming a rough mixt. of com. lecithin and granular sugar to form a greasy mass and subjecting the greasy mass to a grinding operation simultaneously to reduce the size of the granules and to distribute the lecithin uniformly thereover.

EMULSION. M. Katzman, F. J. Cahn, and A. K. Epstein (The Emulsol Corporation). *U. S. 2,334,709.* An acid- emulsifying agent comprises a mixt. of a cation-active substance, in the form of a hydrochloride of higher mol. wt. fat acid esters of monoethanolamine, with monostearin, the monostearin being substantially in excess of the cation-active substance.

RECOVERY OF ORGANIC COMPOUNDS. H. Dreyfus (Cellanese Corporation of America) *U. S. 2,331,965.* Process for the recovery of a distillable fatty acid from a salt thereof comprises subjecting the salt to reaction with a normally solid inorganic acid selected from the group consisting of boric acid, hydrated alumina, and silicic acid so as to distill off from the reaction mixt. the free fatty acid.

LIQUID WAX POLISH. J. M. Olson (Minnesota Mining & Manufacturing Co.). *U. S. 2,331,925.* The polish contains wax, fat acids, rosin, NH_4OH and water.

EPINEPHRINE DERIVATIVE AND PREPARATION THEREOF. E. L. Gustus (Wilson & Company). *U. S. 2,332,075.* An epinephrine salt of a lauryl ester of a dicarboxylic acid.

PROCESS FOR THE PREPARATION OF HIGHER UNSATURATED ALIPHATIC ALCOHOLS. G. von Schuckmann (American Hyalsol Corporation). *U. S. 2,332,834.* A carrier supported hydrogenation catalyst for reducing unsatd. fatty acids to unsatd. alcs., essentially contains Cu and Cd., the latter being present in the ratio of 15 to 55% of the former.

SOFTENING AGENT FOR HIGH POLYMERIC SUBSTANCES. W. Gruber and H. Machemer (Alien Property Custodian). *U. S. 2,332,849.* The method of plasticizing and thermally stabilizing polyvinyl chloride comprises incorporating therein an aliphatic ester of diacetoxystearic acid.

PROCESS FOR PREPARATION OF SULPHONAMIDE DERIVATIVES. Z. Földi, A. Gerces, I. Demjen, and R. König (Alien Property Custodian). *U. S. 2,332,906.*

LUBRICANT. L. L. Davis and B. H. Lincoln (Socony-Vacuum Oil Company). *U. S. 2,335,261.* A lubricant comprising in combination a hydrocarbon oil and 0.25-15% of a metal soap of an aliphatic substituted fatty acid.

LUBRICATING COMPOSITION AND POUR DEPRESSOR THEREFORE. E. Lieber and M. E. Thorner (Standard Oil Development Company). *U. S. 2,334,565.* Polymerized glycerol is used as a pour depressor for mineral oil lubricants.

STABILIZED GREASE COMPOSITION. R. S. Barnett and G. Kaufman (The Texas Company). *U. S. 2,334,239.* A stabilized grease compn., comprises a homogeneous mixt. of a mineral oil, an amt. of lime soap of high mol. wt. fat acids sufficient to impart to said mineral oil the consistency of a grease, and a minor proportion of a stabilizing mixt. consisting of castor oil and an ester of a higher fat acid and a polyhydric alc., said ester being of the group consisting of partial esters and esters contg. ether linkages.

Abstracts

Soaps

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WASHING COMPOUNDS AND DERMATITIS. *Perfumery and Essential Oil Record 34,* 262-3 (1943). The preparation contains approximately 75 per cent borax and 25 per cent dry soap, the borax being finely granulated and added because of its softness, solubility, detergent and water softening properties, and mild alkalinity. The resulting product is an efficient washing compound possessing desirable fungicidal properties, and, at the same time, is so mild in its action on the skin as to reduce any tendency to dermatitis.

NEW WAR-TIME ADDITIVES FOR SOAP MANUFACTURE. Paul I. Smith. *Am. Perfumer & Essential Oil Rev. 45,* No. 10, 61-3 (1943). Methyl cellulose, if incorporated into soap, aids its detergent action and produces a more lasting and satisfying lather. This cellulose material is odorless, tasteless, nontoxic, and colorless. It is soluble in cold water, but insoluble in hot water and in saturated salt solutions. It is stable to alkalies and to dilute acids over a pH range 2-12. Alkalies, including caustic soda, caustic potash, and lime water, act to increase the viscosity of methyl cellulose solutions but have no other effect on them. The advantages of methyl cellulose in soap manufacture are: increase in the hardness of the soap; improvement in the texture, sheen and general appearance; improvement in the lathering properties; and in the smoothness of the lather. Emulsifying and foaming compounds are discussed in relation to extending and improving lower grade soaps.

IMPROVEMENTS IN THE MANUFACTURE OF EXTRUDED SOAP. *Perfumery and Essential Oil Record 34,* 259-61 (1943). Milled soap containing high proportions of the β soap phase suds readily. A new process which yields soap of this type consists of mechanically agitating or working soap of appropriate composition while it is being cooled from a fluid or molten state through varying degrees of plasticity causes the formation of the β soap phase, when, and only when, the final operation of the soap leaving the agitating operation is below a critical value which varies with the chemical composition of the real soap portion of the mass and with the moisture content; also, that when the temperature of the soap leaving this agitating operation is kept above a power limit at which the mass substantially loses its pasty cohesiveness, a product is formed which is softer and less tough and translucent than milled soap of like formula.

PROPERTIES OF DETERGENT SOLUTIONS. Thomas H. Vaughn and Anton Vittone, Jr. *Ind. & Eng. Chem. 35,* 1094-98 (1943). In washing tests made at 60° C. with artificially soiled muslin the effect of 0.05 per cent of various alkaline builders on the detergency of 0.1 per cent soap solutions is investigated. It is shown that high detergent action can be obtained with some builders having a low detergent rating by using the proper ratio of soap to builder. In tests of soil at 60° C. the whiteness retention property of the builders is investigated at a soap concentration of 0.1 per cent and a soap to builder ratio of 1 to 1. It is shown that the silicate and phosphates differ from other builders in their action on soap with respect to whiteness retention.

ESTIMATION OF FATTY ACIDS IN SOAP. *Ind. Chemist 19,* 580 (1943). It is well known that when coconut or palm oil is employed in the preparation of soap, estimations of fatty acids, carried out in the conventional manner usually give low results. This has been ascribed to the volatility of capric and caprylic acids. In the present work results have been obtained which