

ABSTRACTS

Oils and Fats

Edited by
W. F. BOLLENS and R. E. KISTLER

Basic questions involved in the production of vegetable fats and oils. H. WACKEROW. *Allgem. Oel- u. Fett-Ztg.* 29, 205-7 (1932).—W. discusses the possible effects of varying climatic conditions and physiol. changes in the oil seeds on the oil produced. The following percentages give the results for extrn. of soy beans with ether, petr. ether and benzene, resp., for diff. periods of time. Two hrs. 17.74, 18.12, 18.74; 3 hrs. 17.76, 18.56, 19.27; 4 hrs. 17.76, 18.58, 19.88; 5 hrs. 17.77, 18.60, 20.39; 6 hrs. 17.77, 18.63, 20.87; 7 hrs. 17.78, 18.63, 21.18; 8 hrs. 17.78, 18.64, 21.24; 14 hrs. ———, 18.66, 22.87. The higher results when petr. ether and benzene are used are due to phosphatides and non-fatty sol. substances, which interfere with refining operations and lower the quality of the oil. W. B. BOLLENS.

Catalytic effect of caustic alkali on the alcoholysis and hydrolysis of fats. GEOFFREY K. ROWE. *J. Soc. Chem. Ind.* 52, 49-52T (1933).—In 3 series of expts., the first 2 with regulated sapon. by the exact equiv. of caustic potash in 0.1 N etheralc. water soln., and the third with hydrolysis and alcoholysis in the presence of much less (1/4 to 1/20) than the exact equiv., the comparison of residuals with the original fats showed the caustic alkali to have been playing a catalytic role. These results support the view of mechanism of sapon. that the primary reactants are fat and water or fat and alc. HALSEY E. SILLIMAN.

Copper for Twitchell fat-splitting tanks. R. HEUBLYUM. *Fettchem. Umschau*, 40, 6-8 (1933).—Based upon favorable lab. expts. the fat-splitting tanks in a Krasnodar, Caucasus, factory were constructed of Cu and have been in use since 1929 without complaints. P. ESCHER.

Copper vats for fat decomposition. R. HEUBLYUM. *Metallwirtschaft* 12, 12-12 (1933).—Wooden and lead-coated steel vats have not been entirely satisfactory for continuous operation of the Twitchell process for fat decompn. To test the suitability of Cu for this purpose the loss in weight of Cu strips 0.71 mm. thick was detd. when immersed in boiling solns. of 1% H₂SO₄ and in a mixt. of 100 g. oil, 50 g. H₂O, 0.5 g. H₂SO₄ and 1 g. decompn. reagent. The loss in 1% H₂SO₄ was 0.00038 g. per sq. cm. during the first day and 0.00214 g. in 10 days. In the mixt. the loss in weight also slowed up after the first day probably because of the formation of a protective coating. In further tests it was found that Cu had no effect on the yield of fatty acids. A 5-mm.-thick Cu sheet hung in a production vat for 4 months lost 0.5% of its weight. As a result of these tests Cu was used in the construction of vats in a soap factory in Krasnodar, Russia, in 1929, and the vats have operated satisfactorily since. C. E. MACFARLANE.

Neutralization of oils and fats. J. LEIMDORFER. *Seifensieder-Ztg.* 60, 84, 98-9, 115-16, 133-4 (1933); cf. *C. A.* 27, 1776.—Nitrogenous impurities in oils cause foaming during the distn. of the fatty acids; they are removed with either HCl, alum. concd. H₂SO₄, H₃PO₄, by heating to 200-300°, by elec. silent discharge or by Rontgen rays. The free fatty acids can be safely reduced to 0.5-0.2% by distn.; if continued beyond this, especially at increased temp., splitting into glycerol and free fatty acids occurs, this making addnl. deodorization necessary. Vacuum distn. with subsequent earth treatment usually furnishes edible products. The continuous distn. process requires a rather complicated column equipment. In esterification of free fatty acids with glycerol an equil. is reached, and the process is incomplete. Alc. dissolves not only free fatty acids but also some neutral oil. Mixed solvents are now under investigation. In general the less an oil or fat is subjected to heat or chemicals, the better the product. P. E.

A method of determining the oil in a portion of the seed. A. I. ERMAKOV. *Bull. Applied Botany, Genetics Plant Breeding* (U. S. S. R.) Ser. A, No. 3, 83-96 (1932).—The method consists in the extrn. of the oil and its subsequent oxidation by the method of Katsura and Hatakeyama (*C. A.* 25, 4295) with slight modifications. The entire operation is described in great detail with drawings of the app. used and descriptions of the methods of handling it. J. S. JOFFE.

Simplified saponification for the determination of the Reichert-Meissl number. I. DAVIDSOHN. *Seifensieder-Ztg.* 60, 113 (1933); cf. *C. A.* 26, 6167.—D. shortens his method for R.-M. detn. from 2 hrs. to only ½ hr. by stirring the sample with 50% NaOH soln. until it thickens before finishing the reaction in the oven at 50-60°. P. ESCHER.

Industrial chemistry of fish oils with particular reference to those of British Columbia. H. N. Brocklesby and O. F. Denstedt. *Biol. Board Can., Bull.* No. 37, 150 pp. (1933).—Oils and fats are discussed under the following sections: the general chemistry of the fats, the properties of fats and oils, compn. and occurrence of fats and oils with particular reference to fish oils, production and refining of fish oils, utilization of fish oils, fish oils of British Columbia. E. SCHERUBEL.

Fish oils. III. Hydrogenation of pilchard oil. H. N. Brocklesby and F. Charnley. *Contrib. Can. Biol. Fisheries* 7, 523-5 (1933); cf. *C. A.* 27, 1777.—In the presence of a simple Ni catalyst refined pilchard oil hydrogenates largely in 2 stages, the reaction rate over each being mainly of the linear type. The apparent resemblance of the H absorption curve to the unimolecular type under the conditions of the expts. cannot be attributed to the accumulation of impurities in the reaction flask. The relation between n and I no. of the oil hydrogenated to varying degrees is parabolic rather than linear. The fall in I nos. with H absorption proceeds at an approx. const. rate over each stage of the hydrogenation but is not the same for both stages. E. SCHERUBEL.

High-pressure hydrogenation of fatty oils. II. Production of active catalysts by reduction of mixed oxides of Ni and Cu in a medium of fatty oils. Yoshio Tanaka, Ryonosuke Kobayashi and Tohei Takayama. *J. Soc. Chem. Ind., Japan* 36, Suppl. binding 13-14 (1933); cf. *C. A.* 26, 2335.—A mixt. of Ni and Cu oxides, prepd. from a mixed soln. of sulfates, is readily reduced at a lower temp. than either oxide alone in a medium of fatty oils and consequently catalyzes hydrogenation at a lower temp. The temp. of reduction of the oxides and hydrogenation of the oil depends on the ratio of Ni:Cu, being the lowest (130-150°) when this ratio is 1:3 or 1:9. When the dry oxides of Ni and Cu are mixed and used, the temp. of reduction and hydrogenation is lower than with either alone, but higher than when prepd. as above. C. E. HRUBESKY.

Behavior of oils in Wood's light. M. Gisondi. *Ann. staz. chim.-agrar. sper.*, No. 276, 18 pp.—Examn. of the fluorescence in ultraviolet radiation of olive oils of different qualities and ages, and of oils used as adulterants, leads to the conclusion that such variation in the behavior of virgin olive oil occurs as a result of aging under different conditions of storage as to make this test alone unsuitable for judging whether virgin oil has been mixed with refined oil or otherwise adulterated. B. C. A.

PATENTS

Fat-Hardening Without Hydrogen. *Journal of the Society of Chemical Industry*, Vol. 52, No. 1, Page 28, January 6, 1933. J. Davidsohn (*Allgem. Oel-u. Fett-Ztg.*, 1932, 29, 545-6). Samples of sesame and arachis oil hardened by a new process (patent applied for; details unknown) without the use of H₂ had, respectively: Melting point, 44°, 35°; iodine value 85°, 64°; unsaponifiable matter 7.09% (melting point 48°), 8.15% (melting point 52°). The unsaponifiable matter was waxy in appearance and consisted mainly of alkalies with only small amounts of hydrocarbons.

Direct Preparation of Saturated Fatty Acids by Hydrogenation. *Oil and Color Trades Journal*, Vol. LXXXIII, No. 1801, Page 1057, April 21, 1933. Although solid fatty acids can be prepared by hydrogenation of an oil, followed by splitting of the saturated product, a writer in "*Les Matieres Grasses*" (1933, p. 9744) points out that it would be more convenient if the fatty acid could be prepared in one operation. French patent 126,446 (in addition 132,223) gives one such simplification, in which the oil is submitted to the action of pressure, heat and electric current simultaneously. It is thought that, in this method, there is no hydrogenation. In German patent 515,869 Kaufmann brings about hydrogenation and splitting in one operation, and the presence of water and glycerine produces conditions which do not obtain in ordinary catalytic hydrogenation. 100 parts of refined cottonseed oil are mixed with 100 parts of water, 2 parts zinc oxide, and 10 parts of nickel-carbon catalyst (20 per cent Ni), then heated at 200° C. under 10 atmospheres pressure with hydrogen. After several hours the fatty matter is found to contain 90 per cent free acids, having an iodine value about one-half of that of the original oil.

Refining Oils and Fats. *Chemical Abstracts*, Vol. 27, No. 8, ample crude soy-bean oil is refined. Page 2056, April 20, 1933. Metallgesellschaft A.-G. British 366,996, December 5, 1929. Animal and vegetable oils and fats are freed from lecithin, mucilaginous and other impurities by treatment with diluted HCl and a solution of a metal chloride added