ABSTRACTS

Oils and Fats

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

Changes in fats during frying. F. R. PORTER, H. MICHAELIS and F. G. SHAY, *Ind. Eng. Chem.* **24,** 811-13 (1932).—Heating a fat causes a slight acid formation and an increase in viscosity, with gum formation at higher temps. In frying, the decompn. is a result of a reaction with water which is catalyzed by the first acid formed. More than 2% of acid is objectionable. AMY LeVESCONTE.

The composition of peanut oil. D. MAROTTA and S. ANSELMI. *Ann. chim. applicata* **22,** 193-6 (1932).—By use of the method of Vulte and Gibson (*J. Am. Chem. Soc.* **22,** 1 (1901)) for identifying the same glycerides in corn oil, the glycerides ot hypogeic, palmitic and stearic acids were shown to be present in peanut oil. A. W. C.

Twitchell's fat-splitting reagent. X. K. NISHIZAWA and M. OKUYAMA. *Chem. Umschau Fette, Öle, Wachse Harze* **39,** 127-34 (1932); cf. *C. A.* **26,** 3128.—Two active Twitchell reagents were made in the lab. from naphthalene (N) and phenol (P).. The following active constitutents were sepd. according to S. Kuriyama's method (*J. Soc. Chem. Ind. Japan* **26,** 131, 1282 (1923) and **29,** 13 (1926) from T (P), and corresponding ones from T (N): T_o — $HO_3S(HO)C_6H_2(C_{17}H_{34}CO_2H)_2$; T_n — $C_{42}H_{74}O_{11}S_2 + C_{42}H_{74}O_{14}S_8$; T_1 — $(HO)_3C_6H(C_{17}H_{34}CO_2H)_2$; T_1' — $HOC_6H_3(C_{17}H_{34}CO_2H)_2$. The ultimate analysis of these products differs greatly from the compn. found by Kuriyama; their conversion into some definite salts also failed. The effect upon the emulsifying power of 1% aq. solns. of these products at 95° toward olive oil is as follows: AcOH has little effect, but H_2SO_4 and Na_2SO_4 increase emulsification. The T (N) series increased emulsification somewhat more than the T (P) series. The fat-splitting power on H_2SO_4 addn. showed the following relation: $T_o(N) > T_n(N) > T_o(P) > T_n(P)$. The color of the resulting acids, calcd. by taking the degree of fat-split into account, increased considerably at first, but less later. AcOH proved poisonous for the fat-splitting power and even showed much poisoning in the presence of H_2SO_4. P. E.

A study of methods for the analysis of oils, with application to Chinese edible oils. T. Y. TANG. *Acad. Sinica Inst. Chem. Mem.* No. **2,** 1-24 (1930).—Four Chinese edible oils contain the following amts. of solid satd. fatty acids: peanut oil 13.35, soybean oil 8.21, sesame oil 10.81, rapeseed oil 12.70%. Pptn. of metallic salts of Pb, Mg, Zn, Ba and Ca in 90% EtOH furnishes the basis of a modified method for the direct estn. of satd. fatty acids. WM. H. ADOLPH.

Chemical changes in oil seeds between reaping and pressing. F. W. FREISE. *Seifensieder-Ztg.* **59,** 590-1, 608-9 (1932).—The following S. American oil seeds were analyzed: native name: Andiroba, Ayry, Babassu, Batibuta, Bicuiba, Curua, Indayassu, Jauary, Oiticica, Sapulcaia, Urucury. A slow absorption of O_2 and evolution of CO_2 take place during storage at room temp.; more rapidly at 38-45° when as much as 18.5% of material on the dry basis may be converted into alc., CO_2 and traces of glycerol, succinic acid and O_2. The cellulose degradation is accompanied under ordinary conditions by H_2 and N_2 fermentation, but on long ocean transport at tropical temp., the CH_4 fermentation dominates. Much deterioration occurs during crushing and storing, mainly because of unsanitary conditions. The observed loss in the yield of oil (2-12.7%) and the increase in free fatty acids (1-18%) are tabulated for a no. of the oils. P. ESCHER.

The chemical changes in oil-bearing seeds stored under various conditions. M. ZABOLOTSKII and A. BARSUKOV. *Masloboino-Zhirovoe Delo* **2,** 16-22 (1932).—Soy, flaxseed, hempseed and sunflower seed were studied. (1) The seeds with and without chaff were stored with exclusion of air at different degrees of humidity. (2) The moist seeds with and without chaff were stored with access of air. *Results.*—(1) The seeds with chaff showed a higher moisture content than the seeds freed from chaff. (2) The oil content of the seeds increased slightly with the length of storage under the various conditions. (3) The ash content decreased slightly with the length of storage. (4) There was no uniform change in the protein and cellulose contents. (5) The germinative power is slightly higher in the seeds with the highest moisture. (6) The acid nos. increased in the seeds stored under high humidity. Some expts. were carried out to det. the hygroscopic properties of the different seeds. *Conclusions.*—Soy absorbs moisture faster and retains it longer than the other oil-bearing seeds. E. B.

Characteristics of colors in vegetable oils and methods of removal. B. H. THURMAN. *Ind. Eng. Chem.* **24.** 1187-90 (1932).—High color content is found in seeds and pulpy fruit oils with I no. above 20 and freedom from color is typical of nuts oils with I no. under 20. Aging oils refined with caustic and fuller's earth in the dark will lose color while acid-treated oils change little by aging in the dark, but sunlight has a marked reducing effect. Heat bleaching is most effective on oils contg. a high proportion of yellow, while oils contg. high proportions of red and black are not bleached but the color becomes fast and cannot be removed. Fuller's earth, activated carbons and acid-treated clays bleach by absorption: its effectiveness can be measured by the sp. gr. of the bleaching agent. The more efficient an agent is in removing color the lower the pH. Acid-treated clays contg. some actual free acid are better bleaching agents than the fuller's earths and carbons. E. SCHERUBEL.

The influence of poisoning factors by the hydrogenation of various whale and fish oils. JACOB LUND. *Norske Videnskaps-Akad. Oslo, Skrifter. I. Mat. Naturv. Klasse* **1931,** No. 3. 1-63.—The prepn. of the catalyst is described, likewise the hydrogenation method and the different control methods used to follow the course of hydrogenation. A standard method has been devised by which it has been possible to express numerically both the variation of the activity of the catalyst and the variation in the "hardenability" (I) of the oil from time to time during the treatment. As an aid curves expressing the relation between n and I value have been prepd. for a number of different oils, chiefly from L.'s own exptl. data. The hydrogenation expts. have been carried out under technical conditions, known by experience to give reproducible values, where the possible sources of error are insignificant, compared with the large variations in the I of the various oils. The refined, light-colored oils as a rule have a high I, and the activity of the catalyst is maintained const. In some oils, however, the hardening is found to be appreciably restrained, and the activity of the catalyst decreases rapidly; this is caused by S compds., which poison the catalyst. The refined, medium light-colored oils nearly always have a lower I than the light-colored oils; the cause is the paralyzing effect of an increasing S content. The refined, dark-colored oils have a considerably lower I than the light-colored oils, the cause being a further increase of the S content, owing to decompn. in the crude oil. The crude oils always have a lower I than the corresponding refined oils, and the poorer the quality of the oil, the larger the difference. In some cases, the very light-colored crude oils show a relatively high I, but the restraining effect is, as a rule, not to be mistaken. It is due, partly to N compds., partly to S compds.; the relative importance of these compds., as regards their influence upon I, is variable. By the medium light-colored oils, both these kinds of impurities are of increasing importance. At the same time, free fatty acids and oxidized fatty acids begin to exert a restraining influence. Therefore, these oils are, generally, difficult to harden. With the dark-colored crude oils, the content of S compds., N compds. (simple and complex), free and oxidized fatty acids and pitchy substances is so high, that these oils are always very difficult to harden. It may also occur, with very impure oils, that a single one of the said impurities is able to induce a complete poisoning of the catalyst; in such cases, even a diln. of the oil with several times its vol. of pure oil will still give a mixt. which cannot be hardened. H. C. M. INGEBERG.

The use of monoethyl ether of ethylene glycoll in the analysis of fats. E. JAFFE. *Ann. chim. applicata* **22,** 436-33 (1932).—$EtO(CH_2)_2OH$ is a very good solvent for most fats and oils, as well as waxes, and has been found useful as such, in a large no. of methods in fat analysis, *i. e.* detn. of acid no.; sapon. index; crit. soln. temp.; in color reactions; as in the Halphen reaction; Villavecchia and Fabris' test; Bellier's reaction; and in prepg. crystals of various fats, where its slow rate of evapn. produces better crystals. A. W. CONTIERI.

Simplified saponification for the determination of Reichert-Meissl numbers. I. DAVIDSOHN. *Chem. Umschau Fette, Öle, Wachse Harze* **39,** 194-6 (1932).—Weigh 5 g. of butter into a porcelain dish; mix with 3.5 g. 50% KOH; hold at 50-60° for 2 hrs.; stir every 30 min. Dissolve the soap with 90 cc. freshly boiled H_2O and rinse into a distg. flask; acidify with 50 cc. 6% H_2SO_4 and distil as usual. P. ESCHER.

COURTESY CHEMICAL ABSTRACTS