

## ABSTRACTS

## Oils and Fats

Edited by

W. F. BOLLENS and M. M. PISKUR

**The Bellier number.** A study of its use for the detection of peanut oil in olive oils. Various other applications. R. Marcille. *14me Congr. chim. ind., Paris* Oct., 1934, 13 pp.—The Bellier no. is the temp. of initial crystn. of the solid acids of a fat or oil in alc. soln., when the soln. is progressively cooled with const. agitation. A recommended technic for carrying out the test is described in minute detail: To 1 cc. of well-clarified oil or fat in a 26-27-mm.  $\times$  22-cm. test tube add 5 cc. alc. KOH (75 g. per l.), saponify by careful heating, using an air-cooled reflux condenser, cool to 30-5°, add 1.5 cc. of 1:2 AcOH and 50 cc. of 70% alc., close the tube with a rubber stopper carrying a semiprecision thermometer graduated from 0° to 60° or from 0° to 100°, and note the temp. at which the soln. becomes cloudy through crystn. The test may be repeated on the same portion of sample, but in order to obtain concordant results the temp. must be raised each time about 15-20° above the clouding point. The Bellier no. of peanut oil is generally given as  $40 \pm 1^\circ$  and that of pure olive oil as 11.8-14.5°. Examn. of a no. of oils of known purity gave values of 9.5-18°, the high values being obtained with Tunisian and Moroccan oils; oil obtained by extn. of press cake gave values of 9-16.5°. For the detection of peanut oil in doubtful cases, mix 9 parts of sample with 1 part of peanut oil (both by wt.) and det. the Bellier no.; with pure olive oil the value will not exceed 20° (except in extremely rare instances). By drawing a curve of the Bellier no. of mixts. of peanut and olive oils, olive oil in peanut oil can also be detected and detd. If a mixt. of 9 parts of the supernatant oil of canned fish and 1 part peanut oil gives a Bellier No. above 19.50, the presence of peanut oil in the canning oil is indicated. As the Bellier no. depends on the solid acids of oils, it might be deduced that its value was proportional to the solid acids content of olive oils; with the proviso that the oils compared contain solid acids of the same type, of which there are 2: acids sepg. as abborescent crystals and giving Pb salts that are completely sol. in warm Et<sub>2</sub>O, and acids sepg. as glomerule-shaped crystals giving Pb salts that are only partially sol. in warm Et<sub>2</sub>O. Some olive oils contain practically exclusively one or other type of acids, while others contain both. As the solid acids are insol. in 70% alc., it is suggested that they might be sepd. by the technic of the prepn. of the Bellier test followed by cooling overnight at 10-12° and then for 1 hr. at 5°, centrifuging, filtering, and detg. the acids by weighing or acidimetric titration. The quant. compn. of a mixt. of solid acids, the nature of which is known, could be obtained by detn. of the Bellier no. and comparing with curves prepd. from the Bellier nos. of known mixts. of the same acids. Oils extd. from olive press cake, when subjected to the Bellier test and then allowed to stand overnight at 20-5°, contain a suspended flocculent ppt. which gradually gathers at the top of the liquid. This test, though possibly not absolutely specific, is very characteristic, and permits detection of the addn. of 5-20% (according to the origin) of such extd. oil to pressed oil.

A. PAPINEAU-COUTURE.

**Solubility of the mixed fat acids of some vegetable oils in aqueous-alcoholic media of various strengths.** L. Margaillan and J. Giscard d'Estaing. *14me Congr. chim. ind., Paris*, Oct., 1934, 2 pp.—Curves are given for the soly. at various temps. of the mixed fat acids of copra, arachis oil and castor oil as a function of the alc. strength of the solvent. The technic used is described. The general trends of the curves for the resp. oils are quite different.

A. PAPINEAU-COUTURE.

**New light on rancidity.** G. A. Wieseahn. *Food Ind.* 7, 222-3, 275-6 (1935).—The Kreis test is not a definite and certain indicator of rancidity. Besides oxidative changes, enzymes may initiate and accelerate rancidity and partially destroy food values of the oil or fat. The use of such antioxidants as maleic acid, soybean flour, gum guaiac, sesame seed or hydrogenated sesame oil has been patented. Many metals accelerate rancidity. Al and Sn are the least objectionable.

C. R. FELLERS.

**Distinguishing refined and unrefined oils and fats by electrical resistance measurement.** S. H. Bertram. *Chem. Weekblad* 32, 296-7 (1935).—All refined oils and fats have a high sp. resistance,  $R_{sp.}$  of the order of  $3-40 \times 10^9$  ohms, while all crude oils and fats have a lower resistance of  $4-60 \times 10^7$  ohms. The difference found for oils previously heated to 125° and filtered is attributed to mucous impurities; the resistance can be increased by heating the oil to 300° and filtering. The temp. coeff. of conduction is practically the same for different types of vegetable or animal oils and fats:  $-0.027$  to  $-0.038$ , av.  $-0.0336$ . A table is given of  $R_{sp.}$  for 41 oils and fats with varying amts. of fat acid; the values were detd. at 20° for oils, and at 50° for fats and calcd. to 20° with the above temp. coeff. value.

B. J. C. VAN DER HOEVEN.

**The constituents of vegetable oils.** H. A. Boekennoogen. *Chem. Weekblad* 32, 230-9 (1935).—A review of natural fat acids, their chemistry, analysis, sepn., etc., and of impurities in oils such as sterols, phosphatides (mucous material), flavoring and coloring matter and vitamins. The influence of aldehydes on rancidity, the detection of such substances and others resulting from fat decompn. are discussed.

B. J. C. VAN DER HOEVEN.

**Constants of animal fats and their mixtures.** Adam Koss. *Przemysl Chem.* 19, 75-85 (1935).—The method of Finkener is the most accurate among others used for detg. the temp. of solidification of fat acids. A modification of the prescribed app., shown in a diagram, makes the detn. simpler and more accurate. The fats should be dried at 100-5° for 30-45 min. before the detn. and during the procedure should be kept quiet and even out of drafts. Mutton, beef, goat, horse and pork fats were studied extensively. The solidification temp. is an unstable value which must be measured at

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once after sapon. Repeated detns. are likely to give progressively lower or higher values, depending on the kind of fat, and an exposure to air or moisture is very likely to affect the value markedly.

A. C. ZACHLIN.

**The hexabromide numbers of linseed oils.** L. Margaillan and M. Carrière. *14me Congr. chim. ind., Paris*, Oct., 1934, 2 pp.—In the detn. of the hexabromide no. of fats or oils, higher results are obtained when the hexabromides (either of the glycerides or of the free acids) are pptd. in the absence of AcOH than when they are pptd. in presence of AcOH. This may be explained by assuming that, in presence of AcOH, only the bromides of  $\alpha$ -linolenic acid are pptd., while in absence of AcOH there are also pptd. the bromides of an isomer which may be called  $\beta$ -linolenic acid.

A. PAPINEAU-COUTURE.

**Formation of olein.** A. Bag. *Masloboino Zhirovoe Delo* 1935, 73-4.—Rapeseed oil, which is not easily hydrogenated, can be successfully utilized for production of olein and oleic acid. A procedure is described.

JULIAN F. SMITH.

Courtesy "Chemical Abstracts"

### PATENTS

**Catalytic hydrogenation of fats and fatty oils.** I. G. Farbenind. A.-G. (Mathias Pier and Friedrich Schiffmann, inventors). Ger. 615,148, June 28, 1935 (Cl. 23d. 2). A sulfide of a heavy metal, *e. g.*, W, Ni, or Co, is used as the catalyst. Precautions to avoid the poisoning of the catalyst are then unnecessary. The reaction may be effected at 20-300° and a pressure up to about 200 atm.

**Defatting animal matter.** Harburger Oelwerke Brinckman & Mergell. Ger. 612,716, May 3, 1935 (Cl. 23a. 2). Animal matter contg. water, such as flesh, is defatted by extn. with  $\text{CH}_2\text{Cl}_2$ .

**Marine oils.** Sigval Schmidt-Nielsen. Brit. 426,752, Apr. 9, 1935. The oils, *e. g.*, cod-liver or whale, are rendered less liable to autooxidation by heating, preferably under pressure, in closed containers without access of air, to 250° or higher for at least 48 hrs. The treatment may be in stages and the products may be used for soapmaking or, preferably after light hardening treatment, for making edible fats.

## ABSTRACTS

### Soaps

Edited by M. L. SHEELY

**Soap in Tubes.** *Drug Trade News*, 10, 20, 2 (September 30, 1935). What is said to be the first departure from the ordinary cake of soap in 200 years is the package produced by Anderson & Gordon Laboratory Corporation, 27 West 15th Street, New York City. It is Dr. Haley's Personal Soap—packed in tubes.

**Free Caustic Alkali in Soap.** *Perfumery and Essential Oil Record*, 26, 9, 362 (September, 1935). In spite of the importance always attached to the presence of small amounts of free caustic alkali in soap, and the narrow limits within which, in specifications, it is usually required to fall, so far unfortunately no really accurate and reliable method for its determination has been evolved. In the Society of Public Analysts' Committee's Report on Determination of Unsaponified Fat in Soap, referred to in these columns last month, it is once again pointed out that during filtration, an alcoholic solution of soap rapidly absorbs carbon dioxide, so that the caustic alkali in such filtrate is lower than it should be, and Hetzer writing recently in the *Fettenem. Umschau* (1935, 35), shows that a further error may be introduced, not only in the alcohol method, but also in that using barium chloride, by the absorption of caustic alkali by saponified fat, which takes place fairly rapidly in alcoholic solution. He has measured the saponification taking place with various oils in contact with alcoholic alkali in 2.5 minutes and

upwards, and finds that after five minutes, with the exception of palm kernel oil, at least 97 per cent saponification has taken place in all cases. It is evidently very necessary, therefore, in testing a soap for free fatty acid or free alkali, that it should be dissolved in the alcohol in the minimum of time possible.

**Continuous Process of Soap Manufacture.** *Perfumery and Essential Oil Record*, 26, 9, 361 (September, 1935). Considerable prominence has been given during the last few months, in the technical press both of this country and of America, to the subject of a continuous process of saponification. One of the most interesting of the methods yet proposed for the purpose is that described in the patents of J. B. E. Johnson (British Patents 367,513 and 423,188, "P. & E. O. R.," 1932, 125, and 1935, 153), in which a mixture of the fatty material and the requisite quantity of caustic soda lye for complete saponification, is forced under a pressure of not less than 150 lbs. per square inch, through a narrow reaction tube or pipe which is heated to a temperature of upwards of 180 degrees C., the heating being accomplished, according to the second patent, by the use of a tube made of electrically-conducting material, *e. g.*, copper, or "staybrite" steel alloy, through which an electric current is passed.

What appears to be a very similar method of saponification has recently been patented in the United States