abstracts

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• Fats and Oils

FURTHER STUDY OF THE GAS-LIQUID CHROMATOGRAPHIC PROPERTIES OF ALL OF THE METHYL UNDECYNOATES AND METHYL CIS-UNDECENOATES. M.S.F. Lie Ken Jie. *(Chemistry Department, University of Hong Kong, Hong Kong.) J. Chromatogr.* 111, 189–94 (1975). The gas-liquid chromatographic properties of both series of C_{11} unsaturated fatty esters were further studied on non-polar (OV-101 and SE-30), semi-polar (XE-69) and polar (FFAP and Carbowax 20M) stationary phases. The equivalent chain length of each isomer is recorded and the stationary phases in separating these isomers is discussed.

SYSTEM FOR DETERMINING PROCESSING LOSSES OR GAINS. F.E. Sullivan. *U.S. 3,909,596.* Method and apparatus for providing substantially instantaneous reading and recording of processing losses and gains from a continuous liquid chemical process, such as refining of vegetable oil. The product inflow into and the product outflow from the process are separately and continuously measured. The measuring device is used to generate electronic pulses corresponding to the measurement, preferably at a rate in the order of, typically, about one hundred pulses per pound of liquid. High speed pulse counters electronically count these pulses, and gate means is actuated each time the pulses coming from either pulse stream reach a total of, say, 10,000. Then, the total count needed for the other pulse stream to reach the same total is determined and is displayed in terms of processing gain or loss percent, to the nearest tenth of 1%. Both counts then start over, and the counting cycles go on continuously. Temperature and moisture corrections may be applied, and an averaging or pulse selection system may be employed to avoid recording or displaying the instantaneous fluctuations that occur within the process system, thereby smoothing out the variations from the average or basic flow rates.

TALL OIL PRECURSORS—AN INTEGRATED ANALYTICAL SCHEME FOR PINE EXTRACTIVES. D.F. Zinkel. *Tappi,* 58, 109–11 (1975). An analytical scheme has been devised that integrates several newly developed chromatographic techniques to give a detailed and quantitative analysis of the constituents of pine extractives that are the precursors of tall oil. This scheme provides for more comprehensive investigation of these extractives than has been possible with conventional methods. (World Surface Coatings Abs. No. 397)

IDENTIFICATION AND DETERMINATION OF HYDROCARBONS IN LINSEED OIL AND LINSEED OIL PUTTY. W. Weisheit and H. Enl. *Seifen, Ole, Fette, Wachse* 99, 711–4 (1973). Hydrocarbon impurities such as paraffin and fuel oil can be detected in linseed oil by TLC on Kieselgel, with light petroleum (boiling range 40–60C.) as solvent and spraying with 0.03% aq. Na fluorescein to make the spots visible in radiation of 254 nm; a soln. of bromothymol blue and H_3BO_3 can also be used as spray reagent. The method is not quantitative as non-hydrocarbon impurities migrate with the paraffin and falsify the results. After chromatography on a Kieselgel column to remove non-hydrocarbon impurities, with CCl_4 as eluent, the eluate fractions can be quantitatively analysed by spectrophotometry in the range of 3-4 μm. Linseed oil putty is examined by extracting the sample with CCl_4 and testing the extract by the methods described above. (World Surface Coatings Abs. No. 394)

EDIBLE WATER IN OIL EMULSION. K. Terada, S. Fujita, and N. Yoshida (Asahi Denka Kogyo Kabushiki Kaisha). *U.S. 3,914,458.* The emulsion comprises (a) 75–95% of glyceride oil liquid at 0 C, (b) 5–25% of water, and (c) 0.1–3% of a sucrose fatty acids ester of HLB 1–4 consisting of (i) 80–100% of the tri-, tetra-, or penta-ester and (ii) 0–20% of the mono- and diester.

COMPREHENSIVE EVALUATION OF FATTY ACIDS IN FOODS. IV. NUTS, PEANUTS, AND SOUPS. G.A. Fistrom, B.C. Stewart, J.L. Weihrauch, and L.P. Posati (Consumer and Food Economics Inst., A.R.S., U.S.D.A., Hyattsville, Md.). *J. Am. Diet. Assoc.* 67, 351–5 (1975). This article is one of a number of reports by the U.S.D.A. presenting updated and expanded tables on lipids and fatty acids in foods. It summarizes data obtained through a comprehensive survery of the post-1960 world's literature and from unpublished sources for the lipid constituents of nuts and soups. For the nuts, the compilations are given on the bases of g/100 g food, edible portion; g/100 g fat; and g/cup kernels. A separate table of the P:S ratio for each nut is given. For the soups, the fatty acids are tabulated as grams in a specified quantity of product, condensed, prepared with water, and prepared with milk.

FLUID SHORTENING. M.E. Norris (SCM Corp.). *U.S. 3,914,452.* A stabilized fluid shortening having beta fat crystals dispersed in liquid vegetable oil comprises (a) 4–14 parts of soft mono- and diglycerides having an iodine value of at least 40; (b) 2–8 parts of ester emulsifiers selected from ethoxylated monoglycerides, ethoxylated sorbitans, ethoxylated mannitans, ethoxylated monooleates, sodium stearoyl-1-lactylate, calcium stearoyl-2-lactylate, sodium stearoyl-2-lactylate, ethoxylated propylene glycol monoesters, ethoxylated triglycerol monostearate, and succinylated monoglyceride; (c) 2–8 parts solid stearine; and (d) 40–100 parts liquid vegetable oil. The soft mono- and diglycerides, ethoxylated monoglycerides, and solid stearine are heated in the liquid oil to form a molten mixture and then quick-chilled to 82–88 F to form beta fat crystals in uniform dispersion in the liquid oil. The fluid shortening has application in yeast-raised baked goods.

PROCESS FOR PREPARING BAKERY PRODUCTS. I. Gawrilow (SCM Corp.). *U.S. 3,914,453.* The process for preparing bakery products, including breads, cakes, sweet goods, icings, toppings, fillings, and fondants comprises blending a minor proportion of shortening with a major proportion of other wet and dry ingredients to form a fluent mixture which is subsequently baked or aerated. The claimed improvement comprises using a melted shortening, which is normally plastic at room temperature, at 120–160 F to blend with the other ingredients. The shortening consists of (a) 77–94% of edible triglyceride fat derived from fatty acids containing 12–22 carbon atoms, having a Wiley melting point of 90–140 F, and having the ability to form, on cooling, stable beta prime crystals; (b) 1.5–8% of monoglycerides; (c) 2–8% of polyglycerol esters; (d) 0.5–2% of ethoxylated sorbitan esters and/or ethoxylated monoglycerides; (e) 0–3% of diglycerides; and (f) 0–2% of phospholipid.

STABILIZATION OF LINOLEIC ACID AT THE PROCESS OF THE AUTOXIDATION BY POTASSIUM IODIDE. K. Kanazawa, G. Danno and M. Natake (Dept. of Agricultural Chemistry, Faculty of Agriculture, Kobe University, Nada-ku, Kobe). *Agric. Biol. Chem.* 39(6), 1177–86 (1975). Many kinds of salts were antioxidative on the autoxidation of linoleic acid (LA) and linoleic acid hydroperoxide (LAHPO). These effects of salts were the most remarkable at 1 M of them. The effect of KI was the strongest among tested salts. LA in KI solution did not absorb any oxygen, and LAHPO in that solution consumed 1/7 of absorbed oxygen by LAHPO in KI free solution, even by additional supply of $FeSO_4$. One more of LA and LAHPO purified from the above oxidizing mixture consumed 1.76 and 0.78 mole of oxygen, respectively. Besides, the addition of I^- to LA was not observed by analysis with GLC-MS. Then, LA and KI mixture in methanol was excited with 315 nm wavelength, and the fluorescence peak was observed at 412 nm. Intensity of this peak depended on the concentration of LA. These results supported the possible antioxidation mechanism of KI on the autoxidizing LA involving the complex formed between LA and KI in the solution.

A MODIFIED TBA TEST FOR THE DETERMINATION OF LIPID OXIDATION. T. Asakawa, Y. Nomura, and S. Matsushita (Research Institute for Food Science, Kyota University, Uji-shi, Kyoto) *Yukagaku* 24, No. 7, 481–2 (1975). A modified TBA test as a method of monitoring lipid oxidation was proposed. This modification is based on the fact that when sodium sulfite is added to TBA reaction mixture, no yellow color is produced and a development of red color increases.

FRACTIONAL ANALYSES OF STEROLS IN SOYBEANS HARVESTED IN JAPAN. M. Katayama, T. Hirota, S. Goto and S. Funahashi (Dept. of Agricultural Chemistry, University of Tokyo, Bunkyo-ku, Tokyo 113, Japan) *Agric. Biol. Chem.* 39, No. 3, 747–8, (1975). Fractional analysis of four classes of sterols in soybeans harvested in the United States gave the following