ABSTRACTS

R. A. REINERS, Editor. ABSTRACTORS: N. E. Bednarcyk, J. Covey, J. G. Endres, J. Iavicoli, F. A. Kummerow, E. G. Perkins, T. H. Smouse, J. A. Thompson and R. W. Walker

• Fats and Oils

STUDIES ON WOOL WAX. I. GENERAL RHEOLOGICAL BEHAVIOR. M. A. Kassem, A. A. Kassem and H. A. Salama (Lab. of Pharm. Sci., Nat. Res. Center, Dokki, Cairo, UAR). *Fette Seifen Anstrichmittel* 71, 552–56 (1969). Wool waxes were studied for their general rheological behavior as a function of breed of animal and geographical locality. The rheological parameters studied included flow curve, structural viscosity at low as well as at high levels of shear, yield and plastic viscosity. The influence of temperature on these parameters was also considered.

IDENTIFICATION OF POLYHYDRIC ALCOHOLS ON THIN-LAYER CHROMATOGRAMS WITH 2-THIOBARBITURIC ACID. M. A. Nisbet (Imperial Tobacco Co. of Canada Ltd., Montreal, Quebec, Canada). *Analyst* 94, 811–12 (1969). A procedure is outlined for identification of glycerol, ethylene glycol and other polyhydric alcohols by thin-layer chromatography. Those with similar retention values are identified by their specific colour reactions with 2-thiobarbituric acid after oxidation with acidic dichromate.

OIL PALM OF INDIAN HABITAT. I. TECHNOLOGY OF OIL PALM OF ANDHRA PRADESH. T. Obi Reddy and S. D. Thirumala Rao (Oil Technological Research Institute, Anantapur, India). *Oils Oilseeds J. (Bombay)* 22(2–3), 16–19 (1969). Samples of fruits and kernels from two African oil palm trees (dura variety) grown in South India were examined. The oil content of the pericarp averaged 77.3% (3.3% water), while that of the kernel averaged 49.0% (5.5% water). Cooking the fruit followed by either hydraulic pressing or centrifugation gave the best recovery of oil (70–80%). The physical and chemical characteristics of the palm oil and palm kernel oil were comparable to those reported in the literature.

FLAMMABILITY OF OILSEED MEALS: CAUSES AND PREVENTION. A. Uzzan (Service Documentation, ITERG, Paris). *Rev. Franc. Corps Gras* 16, 713–19 (1969). It is possible for oilseed meals to burn although the risk of a fire is less than with solvents. Presscake meals can ignite spontaneously due to absorption of moisture from the air during storage. This hazard can be minimized by raising the moisture content of the meal to around 6% before storage. Meals from extraction processes can also ignite spontaneously due to moisture absorption. Because of their small particle size, they may pose a dust hazard and may be ignited by a spark of static electricity. Finally, residual solvent in the meal poses a special danger. The author describes each one of these hazards, the critical conditions for combustion and ways of safeguarding against fires.

APPLICATIONS OF N-BROMOSUCCINIMIDE TO THE STUDY OF UNSATURATED FATTY ACIDS AND THEIR GLYCERIDES. P. Mesnard, J. Loizeau, C. Chapard and M. Badiane (Faculty of Medecine and Pharmacy of Bordeaux). *Oleagineux* 24, 631–3 (1969). N-bromosuccinimide (NBS) in a non-polar solvent adds bromine to a double bond in an allylic position. In a polar solvent (acetic acid or methanol), the bromine adds to the double bond directly. A procedure is described, based on this reaction, for determining unsaturation. After the reaction, KI is added and the liberated I_2 titrated with thiosulfate. The structure of the reaction products of various fatty acids with NBS is discussed.

THE RELATIONSHIP BETWEEN MARGARINE CONSISTENCY AND THE DILATOMETRIC CHARACTERISTICS OF THE BASE FAT. E. Sambuc and M. Naudet (Lab. Nat. Des Matieres Grasses ITERG, Faculte des Sciences, Marseille). *Rev. Franc. Corps Gras* 16, 701–12 (1969). The firmness index (ratio between the amounts of solid and liquid fat determined by dilatometry) of a margarine base oil shows a high degree of correlation with spreadability. An empirical relation of the form $C = kF^n$ was found between the consistency C measured by extrusion and penetration and the firmness index. The constants k and n were evaluated on a number of laboratory—produced samples. Their values depend on the conditions under which the margarines were produced.

TYPES OF MARGARINE REQUIRED BY DIFFERENT CONSUMERS. E. Jahan (I.M.A.C.E., Brussels). *Rev. Franc. Corps Gras* 16, 691–4 (1969). The requirements of margarine consumers affect the position of margarine in the total fat market. The problem of producing industrial-type margarines for which the specifications are quite rigid is discussed. Because of the wide variety of formulas possible, margarines can be supplied to meet individual needs. The present situation and trends as affected by legislation, regulation, custom, distribution and publicity for these products are examined.

IMPORTANCE OF WHEAT LIPOXIDASE IN THE OXIDATION OF FREE FATTY ACIDS IN FLOUR-WATER SYSTEMS. W. R. Morrison and E. A. Maneely (Univ. of Strathclyde, Glasgow, Scotland). *J. Sci. Food Agr.* 20, 379–81 (1969). Wheat flour was extracted with water, and the aqueous extract and flour residue were used in mixing experiments. The enzyme system responsible for the pro rata oxidation of free fatty acids was present only in the flour residue, and lipoxidase was present only in the aqueous extract. It was calculated that lipoxidase could account for only a small proportion of the oxygen consumed in oxidizing free fatty acids, and the significance of wheat flour lipoxidase in dough rheology is therefore less than has been hitherto assumed.

DISTRIBUTION OF FATTY ACIDS IN TRIGLYCERIDE FROM A YEAST SPECIES GROWN ON A FRACTION OF N-ALKANES PREDOMINANT IN TRIDECANE. P. C. Harries and C. Ratledge (Unilever). *Chem. Ind. (London)* 1969, 582–3. The results of studies on the triglycerides formed by a yeast grown on a fraction of n-alkanes rich in C_{13} are described, in terms of the fatty acid distribution between the primary and secondary positions of the glycerol molecule. The triglycerides studied are unusual because of their relatively high content of odd-numbered fatty acids.

SEED FATS OF THE NEW ZEALAND IRIDACEAE. I. M. Morice (Dep't of Scientific and Ind. Res., Wellington, New Zealand). *J. Sci. Food Agr.* 20, 611–2 (1969). The seed fats of four species of *Libertia*, family Iridaceae, have been examined. Those of *L. grandiflora*, *L. ixioides* and *L. peregrinans* are similar to one another and have been found to contain as their predominant fatty acids: 11–22% myristic, 14–21% palmitic, 13–25% oleic and 35–57% linoleic. They differ from the New Zealand Agavaceae, Juncaceae and Liliaceae in containing major amounts of myristic acid. The fourth species, *L. pulchella*, contains less than 1% myristic, 19–26% palmitic, 9–20% oleic and 57–61% linoleic acids.

THEORETICAL TRIGLYCERIDE CONTENT OF VEGETABLE OILS BY A RADIOCHEMICAL TECHNIQUE. C. A. Marcopoulos and K. A. Manolkidis (Democritos Nuclear Res. Center, Athens, Greece). *J. Sci. Food Agr.* 20, 459–63 (1969). The refining losses for a number of olive, corn and cottonseed oil samples, as determined in the laboratory by a chromatographic method, were checked by a radiochemical procedure. By labelling oil samples with ^{14}C-tripalmitate and applying the principle of isotope dilution analysis, the absolute content of neutral oil and the theoretical triglyceride content were determined. In order to examine the effect of sediment in an oil on the deviation of the chromatographic refining loss from the theoretical triglyceride content, various oil samples with high amounts of sediment were compared with normal samples having low or moderate sediment. Relationships are proposed for the calculation of the theoretical triglyceride content from the one determined by the chromatographic method.

MARGARINE COMPOSITION AND PREPARATION THEREOF. J. T. Colburn (Armour and Co.). *U.S. 3,477,857*. The preparation and composition of a margarine product having an intensified butter flavor are described. The margarine product is utilized by blending with normal margarines or other shortening materials to yield a product capable of imparting a butter flavor to baked goods.

(Continued on page 194A)

ITERG Days of Information on Toilet Soap (Paris, June 16-19, 1970)

Among soap and personal hygiene products, toilet soaps have had a phenomenal development of their market during the last few years and their future looks equally promising. This is partly the result of an improved standard of living, which has caused customers to demand better products. It is also the result of scientific progress and improved manufacturing techniques. Consequently, the soap industry furnishes an attractive and diversified gamut of toilet soaps which have gained increased consumer acceptance.

It was considered to be of great interest to analyze the reasons for this situation from a technical viewpoint. Therefore, the Administrative Council of ITERG, in conjunction with the Association of Soaps, Detergent, and Personal Product, has decided to dedicate its 1970 Days of Information to Toilet Soaps.

These Days will take place in Paris on June 16–19, 1970, under the chairmanship of Mr. Cornu, president of the aforementioned association.

An organizing committee, headed by Mr. Bergeron of Colgate-Palmolive, has been working on the program, which promises to be not only of interest but to provide answers to all technical problems as well.

Some of the lectures will be on the following subjects: animal fats and fatty acids and their processing; the shortcomings of toilet soaps; analytic control of their properties; their structure; their purity; pharmaceutical soaps, bar detergents and mixed toiletry products.

The marketing of toilet soaps will also be dealt with. The major part of the conference will be devoted to round table discussions. The first, concerning the technology of toilet soaps, will enable the principal manufacturers of soap making equipment to describe their latest advances. The second will concern additives for toilet soaps, specifically perfumes, coloring agents, deodorants, etc.

For more information please write to: L'Institut des Corps Gras, 5 Boulevard de Latour-Mauburg, 75 Paris 7e, France.

European Meeting of Chemical Engineering and the Achema Congress 1970

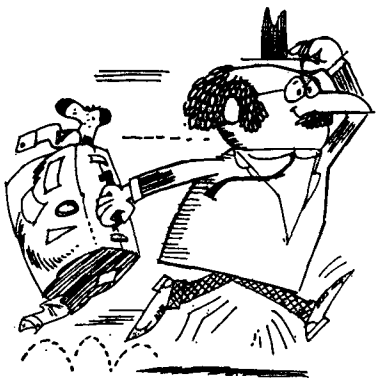
As the 95th event of the European Federation of Chemical Engineering, a European Meeting of Chemical Engineering and the Achema Congress will take place in Frankfurt am Main from June 17 to 24, 1970.

Reports by congress members on technical experiences and experimental results gained upon new developments will be presented in approximately 220 information lectures in the following 13 fields: New processes in chemical technology. Electrochemical measuring techniques. Water, exit gas, waste. Heat exchange. Rectification. Drying. Conveying and separation of particles. Mixing. Compiling and processing of measured data. Level and flow measurement. Large-scale physical apparatus for laboratories (gas chromatography, mass spectrometry, microwave spectrometry, electron optics). New structural materials for chemical engineering. Various subjects.

Besides the lectures, the "individual discussions around equipment on exhibit" will in particular make possible the exchange of experience between chemists and engineers, scientists and technicians, equipment manufacturers and users of equipment, and thus serve to promote research and development in the fields of chemical engineering and technical chemistry.

Over 2,000 firms, including 580 foreign firms from 22

(Continued on page 201A)



Meetings

AOCS National Meetings

Sept. 27-Oct. 1, 1970—Chicago, Conrad Hilton Hotel.
May 2-6, 1971—Houston, Shamrock Hotel.
Oct. 2-6, 1971—Atlantic City, Chalfonte-Haddon Hall Hotel.

AOCS Section Meetings

North Central Section—May 20, 1970, Ladies' Night Old Spinning Wheel, Hinsdale, Ill.
Northeast Section—June 2, 1970, Whyte's Restaurant, New York.
Southwest Section—May 21, 1970, Ladies' Night, Michael's Los Feliz Restaurant, Los Angeles, Calif.

Other Organizations

May 25-27, 1970—16th National ISA Analysis Instrumentation Symposium, Chatham Center, Pittsburgh, Penn.
May 26-27, 1970—25th Anniversary Meeting and dinner dance of the Society of Cosmetic Chemists, Americana Hotel, New York City.
June 3-5, 1970—2nd Central Regional Meeting of the American Chemical Society, Columbus, Ohio.
* June 7-12, 1970—Fourth ISA Process Analytical Instrumentation Short Course, Temple Buell College, Denver, Colorado.
June 9-12, 1970—14th International Conference on the Biochemistry of Lipids, Lund, Sweden.
* June 21-26, 1970—73rd Annual Meeting of the American Society for Testing and Materials, Royal York Hotel, Toronto, Canada.
June 23-25, 1970—Fourth International Sunflower Conference, Sheraton-Peabody Hotel, Memphis, Tenn.
June 22-27, 1970—14th International Congress of Esthetics and Cosmetology, Amsterdam, The Netherlands.
July 7-9, 1970—International Association of Seed Crushers, the Royal Garden Hotel, London, England.
July 26-August 1, 1970—5th International Water Pollution Research Conference, San Francisco, California.
Aug. 9-14, 1970—Third International Congress of Food Science and Technology, Washington, D.C.
Aug. 23-25, 1970—41st Annual Meeting of the National Soybean Processors Association, Fairmont Hotel, San Francisco, Calif.
Sept. 20-23, 1970—International Conference on the Science, Technology and Marketing of Rapeseed and Rapeseed Products, Chantecler Hotel, St. Adele, Quebec.
Oct. 11-14, 1970—Ninth Annual Meeting, ASTM Committee E-19 on Chromatography, Brown Palace Hotel Denver, Colorado.
Oct. 14-17, 1970—International Symposium on Computer Applications in Engineering Sciences, Istanbul Technical University, Istanbul, Turkey.
Oct. 12-15, 1970—84th Annual Meeting of the Association of Official Analytical Chemists, Marriott Motor Hotel, Twin Bridges, Washington, D.C.

*Additions to previous calendar

(Continued from page 192A)

PREPARATION AND USE OF A SMOKE-FLAVORED EDIBLE OIL. C. M. Hollenbeck (Red Arrow Products Corp.). *U.S. 3,480,446.* A process is disclosed for making a smoke-flavored edible oil by contacting the oil with an aqueous smoke-flavored solution.

LECITHIN COMPOSITIONS. W. K. Hilty (Ross & Rowe, Inc.). *U.S. 3,480,544.* Novel, low cost, finely divided, free flowing compositions containing oils and a high lecithin content are disclosed.

METHOD OF DEWAXING RICE OIL. D. N. Kinsey and J. W. Hunnell (Riviana Foods Inc.). *U.S. 3,481,960.* Wax and other insoluble matter of rice oil are removed by chilling the oil or miscella, treating the same with a water solution of sodium silicate causing flocculation of the contaminant particles, and thereafter separating the wax floc from the oil by centrifuging and filtering.

POLYAMIDE COMPOSITIONS OF A POLYMERIC FAT ACID AND A MIXTURE OF DIAMINES. D. E. Peerman and L. R. Vertnik (General Mills, Inc.). *U.S. 3,483,237.* An improved polyamide composition of polymeric fatty acids and a diamine is obtained by replacing a portion of the diamine component with the diamine of a polymeric fatty acid having a dimer content greater than 85% by wt. The products find particular utility in coatings and adhesives.

PROCESS FOR PREPARING MARGARINE. K. F. Gander and E. G. Becker (Lever Bros. Co.). *U.S. 3,488,199.* Margarine is prepared by forming an emulsion of a portion of the aqueous phase and a portion of the fat required, subjecting the balance of the fat to precrystallization, mechanical working and cooling, and thereafter combining the cooled precrystallized fat with the emulsion with gentle working.

METHOD FOR THE REMOVAL OF FATTY ACIDS FROM STARCHES. W. G. Kunze (Nat. Starch and Chem. Corp.). *U.S. 3,485,669.* A method for effecting the extraction of substantially all of the fatty acid content of starches comprises an extraction procedure conducted at reflux temperatures and atmospheric pressure and utilizing a solvent system consisting of a mixture of dimethyl sulfoxide and a hydrophobic fatty acid solvent. The resulting defatted starches may, thereafter, be effectively used in food, adhesive and film-forming applications.

QUANTITATIVE THIN-LAYER CHROMATOGRAPHY USING A FLAME IONZATION DETECTOR. J. J. Szakasits, P. V. Peurifoy and L. A. Woods (Shell Oil Co., Houston Res. Lab., P.O.B. 100, Deer Park, Tex. 77536). *Anal. Chem.* 42, 351–54 (1970). A flame ionization detector has been adapted to scan thin-layer chromatographic strips directly and produce a series of signals proportional to the amount of material present for each of the separated organic components. Thin-layer chromatographic separations are carried out on a metal-backed adsorbent strip that is passed directly between the nozzles of a dual-jet flame ionization detector. The signal from the detector is fed to an electrometer, recorder and digital integrator. The strip is scanned at sufficiently high temperature (300–400C) so that all of the sample is removed from the adsorbent by a single scan. Observed background electronic noise is very low and the high detector sensitivity permits use of very small samples. The apparatus is sturdy and easily constructed.

EXTRACTABLE AND "BOUND" FATTY ACIDS IN WHEAT AND WHEAT PRODUCTS. J. A. Inkpen, and F. W. Quackenbush (Purdue Univ., Agr. Exp. Sta., Lafayette, Ind. 47907). *Cereal Chem.* 46, 580–87 (1969). To provide quantitative data on the fatty acids in a broadly representative group of samples of wheat and wheat products, total lipid was obtained by extraction with chloroform-ethanol-water and subsequent hot acid hydrolysis of the extracted residue to obtain "bound" lipid. The chloroform-ethanol-water solvent was as effective an extractant as water-saturated *n*-butanol; however, both solvent systems extracted substantial amounts of non-lipid (hexane-insoluble) substance, and neither effected complete removal of lipid material from the sample as shown by subsequent acid hydrolysis of the extracted residue. The extractable lipid from wheat and wheat flour contained much more stearate, much less palmitate and usually more linoleate than the "bound" lipid removable only after acid hydrolysis. One hundred fifty-six samples of wheat, wheat flour and wheat consumer products were analyzed for total and individual fatty acids.

THE EVAPORATION RESISTANCE OF MIXED MONOLAYERS OF NON-IDEAL SURFACE SOLUTION OF LONG-CHAIN NORMAL ALCOHOLS, ACIDS AND ESTERS. Meng-Kun Lu, Jen-Feng Kuo, and Ching-Se Yen (Dept. of Chem. Eng., Provincial Cheng Kung Univ., Taipei, Taiwan, China). *Chemistry (Taipei)* 1–2, 7–17 (1969). The rate of evaporation of water was studied by spreading monolayers of *n*-hexadecanol, *n*-octadecanol, *n*-eicosanol, stearic acid, palmitic acid, ethyl stearate and their mixture on pure water surface. The rate of evaporation of water at 30C was measured by the rate of adsorption of water vapor by solid lithium chloride desiccant supported above the water surface. The specific resistance of mixed monolayers of *n*-long-chain alcohols and acids deviated from the ideal mixture law which is the linear relation between logarithm of specific resistance and the molar composition. When the specific resistance of pure alcohol monolayer was greater than that of pure acid monolayer, the mixed monolayer showed positive deviation. It behaved ideally at film pressure of 10 dyne/cm. On the other hand when the specific resistance of pure alcohol monolayers was smaller than that of pure acid monolayers, the mixed monolayers showed negative deviation.

THE INFLUENCE OF VARIOUS STORAGE CONDITIONS ON THE COMPOSITIONS OF RICE LIPID. Po-Tung Hsieh and Chien-Chun Yang (Inst. of Agr. Chem., National Taiwan Univ., Taipei, Taiwan, China). *Chemistry (Taipei)* 3, 37–45 (1969). The changes of lipid composition of Penglai and native rices during storage under various conditions were studied by gas chromatography and the following results were obtained. The free fatty acid content in rice lipid could be employed as a measure of rice quality. The fat-by-hydrolysis fraction remained unchanged in quantity, however, the quantity of neutral fat fraction decreased and that of free fatty acid fraction increased. The greater the change of rice lipid, the worse the rice quality. The major fatty acids in rice lipid were palmitic, oleic and linoleic with smaller amounts of myristic, stearic and linolenic. The deterioration in quality of rice and of hulled rice was considerably reduced by storage under nitrogen gas or at low temperature. There was a linear relationship between the increase of total free fatty acid content and the decrease of fatty acids combined in the neutral fat fraction. Free fatty acids were released from their corresponding combined form in the neutral fat fraction, with the unsaturated free fatty acids seemingly released more rapidly than the saturated. Unsaturated fatty acids were easily cleaved by oxygen.

ORIGIN AND NATURE OF AROMA IN FAT OF COOKED POULTRY. E. L. Pippen, E. P. Mecchi and M. Nonaka (USDA Western R&D Div., ARS, Albany, Calif. 94710). *J. Food Sci.* 34, 436–42 (1969). Odor panel results indicate characteristic cooked poultry aroma in fat of cooked poultry is derived from the lean portions of meat. Migration of sulfur substances into the fat during cooking supports this concept. The dependence of the magnitude of the sulfur buildup in fat upon cooking conditions, the nature of aroma components found in fat of roasted turkey and the readiness with which authentic amino acids are degraded in hot fat, all suggest that protein, amino acids, sugars and other water soluble components are involved in the formation of the characteristic aroma that accumulates in fat of cooked poultry.

LIPID OXIDATION IN FULL-FAT AND DEFATTED SOYBEAN FLAKES AS RELATED TO SOYBEAN FLAVOR. D. J. Sessa, D. H. Honig and J. J. Rackis (NRRL, Peoria, Ill. 61604). *Cereal Chem.* 46, 675–86 (1969). Extracting 99.8% of the oil from full-fat soybean flakes with pentane-hexane removed none of their green-beany, bitter flavor. This oil, with paraffinlike, vegetable-oil flavor, did not develop any further flavor on storage. Almost all the flavor and residual lipids from defatted soybean flakes were extracted by hexane-absolute ethanol azeotrope (79:21). The oil and azeotrope extracts had thiobarbituric acid (TBA) numbers of 5.8 and 34, respectively. In both full-fat and defatted flakes *n*-hexanal, acetaldehyde, and acetone represented the major volatile carbonyl compounds. From defatted flakes,

(Continued on page 196A)