Abstracts

Oils and Fats

Edited by
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THE EFFECTS OF RADIOACTIVITY ON FATTY ACIDS. C. W. Sheppard (Vanderbilt Univ., Med. School, Nashville, Tenn.) and V. L. Burton. *J. Am. Chem. Soc. 68,* 1636-9 (1946). There appear to be several processes involved in the decomposition of a fatty acid molecule under α-particle bombardment: (1) dehydrogenation, (2) decarboxylation, (3) formation of low molecular weight, water-soluble acids, (4) formation of methane and higher hydrocarbons, (5) production of CO and water, either directly from the molecule or in small part from the action of α-particles on the CO_2 and H_2 already formed.

PREPARATION OF A RANEY NICKEL CATALYST. A. A. Pavlic and H. Adkins (Univ. Wisconsin, Madison) *J. Am. Chem. Soc. 68,* 1471 (1946). A procedure for preparing Raney Ni from the Ni-Al alloy is described. The catalyst so obtained is more active, particularly at temperatures below 100° than is Raney Ni prepared by other procedures known to the authors.

NEW METHOD FOR THE DETERMINATION OF α-MONOGLYCERIDES IN TERNARY MIXTURES OF GLYCERIDES BY SODIUM PERIODATE. N. Ivanoff. *Bull. matières grasses inst. colonial Marseille 29,* 45-50 (1945). The action of alkali periodates, noted by Malaprade in oxidizing quantitatively the OH in the α-position of polyalcohols with the formation of 2 molecules of corresponding aldehydes is utilized for the determination of α-monoglycerides. (*Chem. Abs. 40,* 5361-2.)

THE ACIDIC CONSTITUENTS OF DEGRAS. A NEW METHOD OF STRUCTURE ELUCIDATION. A. W. Weitkamp (Standard Oil Co., Whiting, Ind.). *J. Am. Chem. Soc. 67,* 447-54 (1945). Thirty-two of the acidic constituents of degras have been isolated and identified. These include 9 normal fatty acids, C_{10} to C_{26}; 2 optically active 2-hydroxy acids, C_{14} and C_{16}; 10 iso acids, C_{10} to C_{28}; 11 dextro-rotatory *anteiso* acids, C_9 to C_{27} and C_{31}. Dark field photomicrographs of representative members of each of the 4 series have been prepared. A new method of structure elucidation applicable to acids or amides with simple branched chains is based on the number of transitions appearing in the solidification point curves of the binary mixtures of the branched acid or amide with normal fatty acids or amides. This report marks the discovery of a new series of natural fatty acids with a Me group on the third C from the end of the acid; these were named *anteiso* acids.

DESTRUCTION OF VITAMIN A IN SHARK-LIVER OIL. I. DURING NORMAL STORAGE: ESTIMATION OF VITAMIN A BY THE PULFRICH PHOTOMETER. S. Dattatreya Rao (Indian Inst. Sci., Bangalore). *Indian J. Med. Research 32,* 155-60 (1944). The color developed on whole oil in the Carr-Price reaction follows Beer's Law closely, with filter S61, at extinction values below 0.5. On the unsaponifiable fraction the color follows Beer's Law at much higher concentrations. Loss of vitamin A on storage of oil in the dark at room temperature varies from 25-58% during storage periods of 2-23 months. II. DEVELOPMENT OF ACIDITY DURING STORAGE OF LIVERS. S. Dattatreya Rao and B. N. Banerjee. *Ibid.* 161-4. The free fatty acid, color, and odor of oils increase rapidly during storage of livers. However, the vitamin A potency of oils from livers treated with salt during storage is substantially the same as that of oils from fresh livers. (*Chem. Abs. 40,* 3854-5.)

THE VARIED INFLUENCE OF FAT- OR OIL-CONTAINING DIETS ON THE STEROL CONTENT OF THE ADRENALS. I. Abeline (Univ. Bern). *Experientia 2,* 105 (1946). White rats fed on diets containing oils have much more sterol in their adrenals than control rats in whose diets the oils have been substituted by fats. It is noteworthy that such an increase in the cholesterol content of the adrenals is accompanied by increase in body weight, improved appearance and increased resistance to postoperative infections. (*Chem. Abs. 40,* 4122.)

CETYL PYRIDINIUM CHLORIDE. I. GERMICIDAL PROPERTIES. R. Quisno and M. J. Foter (Wm. S. Merrell Co., Cincinnati, Ohio). *J. Bact. 52,* 111-17 (1946). Cetyl pyridinium chloride is germicidal in high dilutions against a variety of gram-positive and gram-negative bacteria, certain common pathogenic fungi, and the flagellate, *Trichomonas vaginalis.* Cetyl pyridinium chloride is germicidal in high dilutions under acid as well as alkaline conditions. The compound is actively germicidal at room temperature as well as at 37°. Cetyl pyridinium chloride is germicidal in moderate to high dilutions in the presence of animal serum. The nontoxic character of the compound and its bactericidal properties under diverse conditions make it an exceptionally versatile and valuable disinfectant.

APPLICATIONS OF QUATERNARY AMMONIUM COMPOUNDS IN THE BAKING INDUSTRY. G. J. Lehn and R. L. Vignolo (Turco Products, Inc.). *Bakers Digest 20,* 80-3, 89-90 (1946). Non-toxic, odorless and tasteless quaternary ammonium compounds possess a notably high antibacterial potency. Thoroughly tested under a wide range of conditions by the Armed Forces, these sanitizing agents appear to be destined to render useful services in commercial food processing plants, including bakeries.

QUATERNARY AMMONIUM GERMICIDES. COMPARATIVE METHODOLOGICAL STUDIES SHOW THE ORIGINAL F. D. A. METHOD OF DISINFECTANT TESTING TO BE UNSUITABLE FOR QUATERNARY AMMONIUM COMPOUNDS. E. G. Klarmann and E. S. Wright (Lehn & Fink Products Corp.). *Soap Sanit. Chemicals 22,* No. 8, 139, 141, 143, 145, 147, 149, 163 (1946). The original F. D. A. method furnishes an erroneous idea regarding the disinfectant potency of 4 quaternary ammonium compounds and of a long-chain alkylamine, as conveyed either by the minimum germicidal concentrations effective in 10 minutes at room temperature, or by the phenol coefficients calculated therefrom. The "filter paper" or "semimicro" technic allows a more proper evaluation of the disinfectants. The germicidal action upon *S. aureus* of the 4 quaternary ammonium compounds and of the long-chain alkylamine is substantially lower than claimed, and lower than indicated by the original F. D. A. method. Reference is made to the economic disservice rendered to the position of other disinfectants by attributing to the quaternary ammonium compounds substantially greater germicidal powers than actually possessed by them.

THE EFFECTS OF A HIGH FAT DIET IN A TEMPERATE ENVIRONMENT. F. C. Consolazio and W. H. Forbes (Harvard Univ., Boston, Mass.). *J. Nutr. 32,* 195-211 (1946). A group of 8 men living in a cool environment and doing work consisting mostly of laboratory procedures subsisted for 9 days on a high fat diet (pemmican) providing 71% of the calories from beef fat and 2% from carbohydrate. Four controls subsisted on a diet adequate in all respects and providing 30% of the calories from fat. The utility of pemmican alone as a field ration for ordinary men was very poor because of the inability of all but one subject to eat enough of it. Morale deteriorated on the diet and most of the men resigned themselves to semi-starvation for the duration of the diet, mainly because of the nauseating taste. Nevertheless, scores in a physical fitness test remained practically constant. This work should not be taken to apply to all high fat diets, but at this point the authors do not know why there appears to be a difference between a diet of pemmican and a diet of fresh meat and fat.

BIOLOGICAL INCORPORATION OF A CHOLINE HOMOLOGUE INTO LIVER PHOSPHOLIPIDS. C. S. McArthur (Univ. Toronto). *Science 104,* 222-3 (1946). The "choline fraction" was precipitated from the hydrolysate with K tri-iodide reagent at about 0°. The bases were freed and oxidized with alkaline permanganate at the boiling point. The resulting tertiary amines were separated by fractional distillation on a microscale and identified as chloroaurates. The finding of trimethylamine (from choline) was anticipated, of course. The isolation of a significant percentage of the fraction as triethylamine, which could have been derived only from the triethyl homologue of choline, proved that this foreign quaternary ammonium base with lipotropic properties had been incorporated into the phospholipids of the liver.

THE INFLUENCE OF BIOTIN UPON THE RELATIVE LIPOTROPIC EFFECTS OF CHOLINE AND INOSITOL. C. H. Best, C. C. Lucas, J. M. Patterson, and J. H. Ridout (Univ. Toronto). *Biochem. J. 40,* 368-73 (1946). No evidence has been obtained to support the claims (a) that biotin produces a selective deposition of cholesteryl esters in liver, (b) that inositol has a specific effect on bound cholesterol, and (c) that the fatty liver observed when biotin is administered is particularly resistant to the action of choline. The accumulation of cholesteryl esters in liver bears a remarkably constant relationship to the deposition of glyceride in this organ. The administration of biotin does not affect this relationship. The synergistic effect of choline and inositol on liver lipids has been confirmed. No evidence of any effect of choline, inositol or biotin upon the absolute amount of phospholipin or of free cholesterol in the liver has been obtained in this series of experiments, nor has any effect upon kidney lipids been observed. The absence of a specific effect of biotin on the deposition of liver fat necessitates a revision of certain theories and deductions, two of which (Beveridge and Lucas, 1945; McHenry *et al.*, 1941-4) have been discussed. It is recommended that the term "biotin fatty liver" be abandoned.

THE LIPOTROPIC ACTION OF MANGANESE. M. O. Amdur, L. C. Norris, and G. F. Heuser (Cornell Univ., Ithaca). *J. Biol. Chem. 164,* 783-4 (1946). At a given level of choline, more fat was observed to be present in the livers of Mn-deficient rats than in the livers of rats receiving adequate Mn. The lipotropic action of Mn was much greater when the choline content of the diet was low, thus indicating an interaction between Mn and choline. An analysis of variance showed that the reduction of liver fat by Mn was highly significant. As expected, choline likewise markedly reduced liver fat. The Mn by choline interaction was found to be highly significant. As further evidence the Mn has a lipotropic action, it was found that the presence of Mn in the diet caused a highly significant reduction in the percentage of fat occurring in the fresh bone. Choline also significantly reduced bone fat.

PATENTS

METHOD OF DEODORIZATION. G. W. Phelps and H. C. Black (Industrial Patents Corp.). *U. S. 2,407,616.* The equipment for steam-vacuum deodorization of fats contains means for supplying heat to the vapor zone above the liquid in order to minimize the reflux condensation of the vapors issuing from the liquid.

NORDIHYDROGUAIARETIC ACID CONCENTRATE. O. Gisvold (Univ. Minn.). *U. S. 2,382,475.* The process comprises extracting plant material of the species *Larrea divaricata* with an aqueous solution of alkali hydroxide containing a reducing agent, acidulating the aqueous extraction solution until a flocculent precipitate occurs, and separating the flocculent nordihydroguaiaretic acid containing precipitate. The preparation is an antioxidant.

TERNARY SYNERGISTIC ANTIOXIDANT COMPOSITION. R. W. Riemenschneider and J. Turer (Sec. Agr.). *U. S. 2,383,815.* The antioxidant composition comprises an ascorbyl monoester of a saturated aliphatic monocarboxylic acid containing 12-18 C atoms per molecule, α-tocopherol, and soybean phospholipids.

Abstracts

Drying Oils

Edited by
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KINETIC STUDIES IN THE CHEMISTRY OF RUBBER AND RELATED MATERIALS. II. THE KINETICS OF OXIDATION OF UNCONJUGATED OLEFINS. J. L. Bolland and G. Gee (Brit. Rubber Producers' Research Assoc., Welwyn Garden City, Herts, Eng.). *Trans. Faraday Soc. 42,* 236-43 (1946). The kinetics of the autoxidation of Et linoleate, Et linolenate, Me oleate and squalene were studied, and in several instances autoxidations catalyzed by benzoyl peroxide were included. The process is believed to proceed by means of a chain reaction. The first step is formation of a hydrocarbon radical which unites with O_2 and then reacts with another olefin molecule to produce a hydroperoxide and a new free radical. The chain may be initiated either by direct action of O_2 on the olefin or by decomposition of the hydroperoxide or of the added peroxidic catalyst. Termination occurs by combination of 2 free radicals. III. THERMOCHEMISTRY AND MECHANISMS OF OLEFIN OXIDATION. *Ibid.* 244-52. Bond strengths and resonance energies were employed to estimate the