ABSTRACTS

R.A. REINERS, Editor. ABSTRACTORS: N.E. Bednarcyk, J.E. Covey, J.C. Harris, Yoshio Hirano, S. Kawamura, D.A. Leo, F.A. Kummerow, E.G. Perkins, and R.W. Walker

• Fats and Oils

MONOGLUCOSYLOXYOCTADECENOIC ACID—A GLYCOLIPID FROM ASPERGILLUS NIGER. R.A. Laine, Patricia F.S. Griffin, C.C. Sweeley and P.J. Brennan (Dept. of Biochem., Michigan State Univ., East Lansing, Mich. 48823). *Biochemistry* 11, 2267–71 (1972). Details are given of the purification and structure of an apparently novel type of fungal glycolipid. It was obtained in a relatively pure form by fractionation of the acetone-soluble lipids of *Aspergillus niger* by Florosil column chromatography and finally purified by preparative thin-layer chromatography. On the basis of the evidence obtained from mass spectroscopy, infrared spectroscopy, chromatographic procedures and the alkaline stability of the glycolipid, it is apparently a monoglucoside of a trans-2-hydroxyoctadecenoic acid. The acidic nature of the glycolipid, combined with its relative prominence (about 6% of the total lipid), when phospholipid was depleted (less than 2% of the total lipid), indicated that it had an important role in the structure and function of the fungal membranes.

COMPARISON OF CARBONYL COMPOUNDS IN RAW AND ROASTED RUNNER PEANUTS. I. MAJOR QUALITATIVE AND SOME QUANTITATIVE DIFFERENCES. D.F. Brown, V.J. Senn, J.B. Stanley and F.G. Dollear (Southern Reg. Res. Lab., Southern Marketing and Nutr. Res. Div., ARS, USDA, New Orleans, La. 70179). *J. Agr. Food Chem.* 20, 700–6 (1972). Carbonyl compounds present in oil cold-pressed from raw and roasted peanuts were converted into 2,4-dinitrophenylhydrazones and were identified by comparison of their R_1 values, colors, uv, visible and mass spectra with authentic compounds. Compounds in roasted peanuts included 14 aldehydes, 10 methyl ketones, nine 2-enals, and seven 2,4-dienals. Raw peanuts contained 10 aldehydes, eight methyl ketones, seven 2-enals, and four 2,4-dienals. Hexanal, octanal, nonanal, decanal and pentanal were the major carbonyl compounds in raw peanuts. Roasted peanuts contained very large concentrations of 2-methylpropanal, 2-methylbutanal, and 3-methylbutanal and large concentrations of 2-heptenal, 2-octenal, 2-nonenal, 2,4-decadienal, hexanal, octanal and decanal. The average total carbonyl content and the carbonyl content of the dicarbonyl, ketoglyceride and monocarbonyl fractions in raw peanuts were 62, 30, 24 and 8 μmol per 100 g of oil and in roasted peanuts were 324, 198, 99 and 26 μmol per 100 g of oil, respectively.

CHARACTERIZATION OF NONBASIC STEAM VOLATILE COMPONENTS OF POTATO CHIPS. R.G. Buttery and Louisa C. Ling (Western Marketing and Nutr. Res. Dev. Div.; ARS, USDA, Berkeley, Cal. 94710). *J. Agr. Food Chem.* 20, 698–700 (1972). The nonbasic fraction of the steam volatile oil from potato chips has been analyzed using capillary and packed column gas chromatographic separation, with characterization by mass and infrared spectrometry. Forty-six compounds were characterized, of which 25 had not been previously reported in potato chips. Some of the more important aroma compounds in this fraction include methional, 3-methylbutanal, phenylacetaldehyde and deca-trans-2,trans-4-dienal.

VARIETAL DIFFERENCES AND SEASONAL EFFECTS OF FATTY ACID COMPOSITION AND STABILITY OF OIL FROM 82 PEANUT GENOTYPES. R.E. Worthington, R.O. Hammons, and J.R. Allison (Dept. of Food Sci. and Agr. Economics, Univ. of Georgia Station, Experiment, Ga. 30212). *J. Agr. Food Chem.* 20, 727–30 (1972). Eighty-two peanut genotypes of diverse genetic background were examined over a 3-year period for varietal differences and seasonal effects on fatty acid composition and oil stability (autoxidation induction period). The range in oil stability among genotypes was 11.6 to 18.5 days and the ranges in fatty acid values were: 7.4 to 12.9% palmitic; 1.6 to 5.3% stearic; 35.7 to 68.5% oleic; 14.1 to 40.3% linoleic; 0.9 to 2.2% arachidic; 0.6 to 2.0% eicosenoic; 1.3 to 5.1% behenic; and 0.6 to 2.0% lignoceric acid. Yearly mean fatty acid values for all varieties showed relatively small but significant ($p < 0.01$) yearly variations in fatty acid composition. Yearly variations in oil stability values were large and could not be accounted for by yearly variations in fatty acid composition. Simple regression of oil stability on various fatty acids or combinations thereof showed significant correlations within a given year but with wide variations in magnitude of r^2 and estimated regression coefficients among years.

ANNOUNCEMENT

The AOCS Governing Board has approved a revision to the price of AOCS Official and Tentative Methods. Effective immediately, a complete set will still cost $50, but a complete set will include all revisions through 1969. The 1970 and 1971 sets will continue to sell for $6 each.

FURTHER STUDIES OF THE CHEMICAL COMPOSITION OF THE LIPOPOLYSACCHARIDE OF PSEUDOMONAS AERUGINOSA. I.R. Chester, G.W. Gray and S.G. Wilkinson (Dept. of Chem., Univ. of Hull, Kingston upon Hull HU6 7RX, U.K.). *Biochem. J.* 126, 395–407 (1972). Qualitative and quantitative analytical results for the lipopolysaccharide from acetone-dried cells of *Pseudomonas aeruginosa* (N.C.T.C. 1999) are presented and possible contamination of the material with nucleic acid was further examined. Additional sugars detected (only in large-scale hydrolysates) were mannose and arabinose; traces of spermidine and putrescine were also found. The heptose component is L-glycero-D-mannoheptose. The thiobarbituric acid-positive component is a 3-deoxy-2-octulonic acid, of which only 35–40% links lipid A to the polysaccharide. This linkage is not broken by hydrolysis with acetic acid up to 0.08M. Liberation of lipid A required hydrolysis with 0.1M-hydrochloric acid, which substantially degraded the polysaccharide moiety. Hydrazinolysis of lipid A destroyed approximately 80% of the glucosamine, and glycosidically linked glucosamine oligosaccharides could not be isolated.

DETERMINATION OF STEROLS IN VIRGIN OLIVE OIL. APPLICATION TO PURITY CONTROL. A. Amati, F.C. Zanirato and G. Ferri. *Riv. Ital. Sostanze Grasse* 48 No. 2, 39–44 (1971). The oil is saponified with methanolic *M*KOH, and unsaponifiable matter is extracted with ethyl ether and separated by TLC on a 3 mm. layer of silica gel with hexane/ether (1:1) as solvent. Spots are revealed with dichlorofluorescein, and the band containing the sterol fractions is extracted with ether. The sterols are converted into trimethylsilyl derivatives by a conventional method, and these derivatives are examined by GLC on columns of 3% of JXR on acid-washed and silanised Gas-Chrom P (100–120 mesh) operated at 260C with N_2 as carrier gas (24 ml. per min.) and flame ionisation detection. In 47 samples of oil, the ratio of β-sitosterol to campesterol plus sigmasterol ranged from 17:1 to 30:1, whereas in other oils (*e.g.* groundnut, rape or soyabean) it was $<4:1$. Results indicate that adulteration by 5–10% of such oils may be determined. (World Surface Coatings Abs. No. 358)

IMPROVEMENT IN THE QUALITY OF PALM OIL. E. Kellens. *Oleagineux* 27, 157–60 (1972). A process is described for extracting and storing palm oil which results in a stabilized, unoxidized oil. During sterilization of the bunches and extraction of the oil from the pulp, high temperatures and contact with air are minimized. The oil is then purified by special demulsification and degumming steps. During storage and transportation, local overheating, excessive temperatures and stratification are eliminated. An oil thus treated retains maximum amounts of the natural carotenoids and tocopherols and minimum amounts of malodorous residues which affect quality. Steam refining of this oil yields 1–1.5% more oil than is obtained from crude oil processed conventionally.

STABILIZATION OF FRYING OILS WITH INERT GAS. V.F. Usenko *et al. Izv. Vysshikh Uchebn. Zavedenii, Pishchevaya Tekhnol.* 1972(1), 81–4. The effect of nitrogen on the thermal stability and rate of oxidation of a hydrogenated sunflower oil (98.4 I.V.) was studied. Two samples and a control were used. The control oil was heated at 160 ± 5C. One sample was deaerated and then saturated with nitrogen before heating. This treatment retarded oxidation for only the first 10 hours. Nitrogen was continuously bubbled through the other sample

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• Referee Chemists . . .

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• Abstracts. . .

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during heating. This treatment practically eliminated oxidative deterioration. (Rev. Franc. Corps Gras)

KINETICS OF EXTRACTION OF MINOR COMPONENTS FROM RAPESEED. I. A. Katzer. *Tluszcze Jadalne* **16**(1), 1–9 (1972). This article is the first of a series reporting on research carried out to determine the relationship between the water content of flaked rapeseeds together with the extraction temperature and the composition of the extracted oil as well as the rate and kinetics of extraction of minor components. The tests were carried out in the laboratory using specially made equipment. (Rev. Franc. Corps Gras)

CATALYST PREPARED BY HOMOGENEOUS PRECIPITATION UNDER HIGH PRESSURE AND TEMPERATURE. W.P. Van Beek and T.J. Osinga (Lever Bros.). *U.S. 3,668,148.* A process for preparing a metallic catalytic agent on a particulate carrier is disclosed. The particles of carrier are suspended in an aqueous solution of a salt of the catalytic agent and of a source of hydroxyl ions. The suspension is heated in a sealed vessel above 100C to precipitate the metal which is then converted to the appropriate active, oxidized, or reduced state. The process is particularly significant with carriers, such as alumina and silica, which can undergo structural changes in alkaline media.

SHORTENING COMPOSITION CONTAINING SILICON DIOXIDE AND A BRIDGING AGENT. M.D. Shoaf, F.M. Ketch and T.S. Wong (General Foods). *U.S. 3,669,681.* Edible oils are mixed with silicon dioxide and a bridging compound and the result is a shortening which will not weep or run at elevated temperatures and still retains desirable mouth-feel characteristics. The shortening is especially useful in baked goods and other foods which are heated prior to comsumption.

METHOD AND APPARATUS FOR CONTINUOUS PRODUCTION OF OIL-IN-WATER EMULSIONS. L.O. Cummings (Pacific Vegetable Oil Corp.). *U.S. 3,669,900.* A system and device for producing an oil-in-water emulsion of high water-insoluble liquid content, e.g., containing 70% to 95% of such liquid or oil, is described. The continuous process includes effecting with a beater very small particles of oil, continuously withdrawing a primary thick emulsion to a dilution zone, and then continuously diluting it with water or other diluent.

CATALYSTS. B.G. Linsen and T.J. Osinga (Lever Bros.). *U.S. 3,673,115.* In the process for preparing a nickel-on-silica catalyst, the use of an intimate mixture of an organic base is described. The base, which is insoluble in the suspension of silica in the aqueous nickel salt solution, serves as a means of withdrawing hydrogen ions from the solution and causing precipitation of nickel from the solution onto the silica carrier.

SIMPLIFIED CONTINUOUS RENDERING SYSTEM. J.G. Keith (Duke, Inc.). *U.S. 3,673,227.* A continuous process for the dry rendering of raw materials in the form of animal, poultry and fish byproducts to produce fat and tankage is described. The raw materials are reduced to a mean particle size and then cooked under controlled moisture and temperature conditions in order to free the fats.

PROCESS FOR ADSORBENT BLEACHING OF EDIBLE OILS. R.D. Harris and L. Levine (Procter & Gamble). *U.S. 3,673,228.* In the process, adsorbent agent usage is reduced by deaeration and moisture adjustment of the oil/adsorbent mixture. The temperature is raised to 200–400F and then the mixture is passed directly through a bleaching zone under pressure but in the absence of oxygen. Finally, the agent is filtered from the oil. In the bleaching zone, it is important that the oil/adsorbent mixture be in turbulent flow. A multiple stage process may be used.

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• Biochemistry and Nutrition

FATS AND BILE SALTS. 1. PHYSIOLOGIC CONSIDERATIONS, AND (2) PATHOLOGIC CONSIDERATIONS. P.R. Holt (College of Physicians and Surgeons, Columbia University, New York). *J. Am. Dietetic Assoc.* 60, 491–8 (1972). This two part review covers recent advances in the understanding of the interaction of dietary fats, especially triglycerides, with bile salts. Particular reference is made to ways in which advances in the knowledge of the physiology of disease states have led to the development of new approaches in dietotherapy. Specific topics included are the relationships of bile salts to fat digestion and absorption, bile salt metabolism, fat malabsorption due to bile salt deficiency, and cholerrheic enteropathy. Use of medium chain triglycerides in the diet has permitted drastic reductions in the intake of regular fat without inducing significant caloric deprivation.

EXCHANGE OF PHOSPHOLIPIDS BETWEEN BRAIN MEMBRANES IN VITRO. E.K. Miller and R.M.C. Dawson (Dept. of Biochem., Agr. Res. Council Inst. of Animal Physiol., Babraham, Cambridge CB2 2AT, U.K.). *Biochem. J.* 126, 823–35 (1972). When unlabelled mitochondria from guinea-pig brain were incubated with a ^{32}P-labelled microsomal fraction from brain, there was a transfer of phospholipid to the mitochondria,

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• Malaysian palm oil. . .

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requirements may be only ca. 12 million tons. This suggests a surplus of supply over demand, but since all these projections are based upon continuation of current conditions and prices it may reasonably be expected that the normal operations of the market will ensure that demand and supply will be more nearly in balance than the projections suggest. Be that as it may, the next 10 years are likely to see a steady increase in the production and consumption of fats and oils; they are also likely to see a far more than proportionate increase in commercial and other production of palm oil, which between 1970 and 1980 is expected to more than double from the 1970 figure of 1,716,000 tons to a 1980 figure of more than 3,642,000 tons—that is an increase from ca. 4.8% of total production to ca. 7.3%. Since the great bulk of palm oil produced is exported, this in turn means that palm oil's share of the export market must increase from the current figure of ca. 8% to a figure of over 15%.

Malaysian palm oil production

To achieve, in such a relatively short space of time, such a massive increase in the share of the world's oils and fats markets may sound like an overly ambitious program. However let me illustrate by specific reference to Malaysia just how great is the impetus towards increased production of palm oil. This can perhaps best be done by quoting a short series of acreage and production figures showing the history of the palm oil industry in Malaysia and the forecasts which have been made for the future (Table III).

Malaysian palm oil marketing

The future trend in production of Malaysian palm oil is clear—and because the oil comes from a palm which takes 3 years to come into bearing and 8-10 years to reach peak yielding, there is little that can be done to affect that trend: the palms which will provide the palm oil for 1980 are to a large extent already in the ground. It follows that the problem for Malaysian producers—a problem which affects everyone here—is how to market the oil which is going to be available.

It can be stated with confidence that, having achieved such results in the field of production, Malaysian producers will not fall behind in the field of marketing. At the beginning of this year, producers in West Malaysia joined together in a new association known as the West Malaysian Palm Oil Producers Association which has as its specific object "to ensure the efficient and most profitable marketing of palm oil." By means of following agreed policies it is anticipated that a reasonably standard and high grade product can be made available to all users, and we in Malaysia have had proof, in the success which has already been achieved in the promotion of Standard Malaysian Rubber, that if a first class product is offered for sale that product will find a ready welcome from consumers.

In this connection it is relevant to remark that it is not the oil palm industry alone which is dependent upon achieving a successful result in the campaign to market palm oil. As I mentioned earlier, in Malaysia the oil palm industry is now fourth in importance only to rubber, tin and timber. Palm oil, which in 1960 contributed only 2% of total export receipts, in 1971, contributed no less than 7% or 381 million Malaysian dollars. Since this contribution can be expected to increase, it will be apparent that there are very good political as well as economic reasons why the sale of palm oil is of interest and importance to the entire country.

Palm kernels

For every ton of palm oil produced there will be 0.20-0.25 ton of kernels. This is generally true only for the Far East and plantation products; for wild stands such as those obtained in parts of Africa, production of oil and kernels may be almost equal.

Oil is expressed from the kernels, which has a different composition from that of palm oil in that ca. 90% of the fatty acids are saturated, and nearly half of these consist of lauric acid. In fact palm kernel oil is virtually identical with coconut oil, with which it is interchangeable, although refining costs are slightly higher. Also from the kernels, after extraction of the kernel oil (which accounts for ca. 49% by weight) comes palm kernel meal for use as stock fodder. This meal is somewhat variable in composition, especially in fiber content, and has a low protein content when compared, for example, with peanut, soybean or cottonseed meal; it is used chiefly in Europe as fodder for dairy cows.

[Received June 7, 1972]

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which could not be accounted for by an aggregation of microsomes and mitochondria or an exchange with microsomes contaminating the mitochondria. Under similar circumstances there was a transfer of phospholipid from ^{32}P-labelled mitochondria to microsomes, indicating that the process was one of exchange. All of the isolated individual synaptosomal membranes were capable of acquiring phospholipid on incubation with a ^{32}P-labelled brain supernatant fraction although a greater percentage was again exchanged by the mitochondrial fraction.

FATTY ACID SYNTHETASE OF CHICKEN LIVER. REVERSIBLE DISSOCIATION INTO TWO NONIDENTICAL SUBCOMPLEXES OF SIMILAR SIZE. S. Yun and R.Y. Hsu (Dept. of Biochem., State Univ. of New York, Upstate Med. Center, Syracuse, N.Y. 13210). *J. Biol. Chem.* **247**, 2689–98 (1972). The synthetic reaction catalyzed by the chicken liver fatty acid synthetase has a bell-shaped pH rate profile with a maximum at pH 6.7 and gives a discontinuous biphasic Arrhenius plot. The activation energy at low temperature is 28,900 cal per mole, which changes to 11,300 cal per mole at temperatures above 15C.

EFFECT OF PHOSPHOLIPASE C HYDROLYSIS OF MEMBRANE PHOSPHOLIPIDS ON MEMBRANOUS ENZYMES. R.D. Mavis, R.M. Bell and P.R. Vagelos (Dept. of Biol. Chem., Washington Univ. Schl. of Med., St. Louis, Mo. 63110). *J. Biol. Chem.* **247**, 2835–41 (1972). The response of several *Escherichia coli* membranous enzymes to hydrolysis of up to 95% of membrane phospholipid has been investigated. Purified phospholipase C of *Bacillus cereus* was utilized in these studies. The rate and extent of digestion of *E. coli* phospholipids were independent of whether the lipid was associated with membrane protein or extracted from membranes and sonically dispersed. Phosphatidylethanolamine and phosphatidylglycerol were completely hydrolyzed, while cardiolipin was partially resistant to hydrolysis by phospholipase C. Acyl-CoA: glycerol 3-phosphate acyltransferase and NADH oxidase were inactivated at a rate very similar to the rate of hydrolysis of total lipids. These results show the heterogeneity of membranous enzymes with respect to their dependence upon the presence of intact membrane phospholipids.

CHARACTERIZATION AND QUANTITATION OF THE APOLIPOPROTEINS FROM HUMAN CHYLE CHYLOMICRONS. G. Kostner and A. Holasek (Inst. of Physiological Chem., Univ. of Graz, Graz, Austria). *Biochemistry* **11**, 1217–23 (1972). The composition of human chyle chylomicrons was studied. For this purpose, thoracic duct chylomicrons from a female subject were isolated, delipidized and the lipid and protein part investigated separately. For the characterization of the protein part, polyacrylamide gel electrophoresis, immunoelectrophoresis and immunodiffusion were performed. Pure peptides isolated from human serum lipoproteins were used as reference substances. The results indicate that all the peptides of human serum very low density lipoproteins were present in chyle chylomicrons too.

VITAMIN A TRANSPORT IN RAT PLASMA. ISOLATION AND CHARACTERIZATION OF RETINOL-BINDING PROTEIN. Y. Muto and D.S. Goodman (Dept. of Med., Columbia Univ. College of Physicians and Surgeons, New York, N.Y. 10032). *J. Biol. Chem.* **247**, 2533–41 (1972). Studies were conducted to isolate and characterize rat serum retinol-binding protein (RBP), the specific transport protein for vitamin A in the rat. RBP was isolated from rat serum by a sequence of procedures which included: precipitation with ammonium sulfate between 30 and 50% saturation; chromatography on DEAE-Sephadex; gel filtration on Sephadex G-200 and G-100; and preparative polyacrylamide gel electrophoresis. These procedures resulted in RBP which had been purified approximately 2,300-fold, and which was completely pure by physical and by immunological criteria. The properties of rat RBP resemble those of human plasma RBP in many ways. The two proteins have nearly identical ultraviolet absorption spectra (peak maxima at 280 and 330 nm) and fluorescence emission and excitation spectra. The amino acid compositions of rat and human RBP are somewhat similar, both with a fairly high content of aromatic amino acids.

THE EFFECT OF DIETARY SOYBEAN OIL ON THE DEPOSITION OF XANTHOPHYLL IN BROILER SKIN. J.L. Heath and C.S. Shaffner (Dept. of Poultry Sci., Univ. of Md., College Pk., Md. 20742). *Poultry Sci.* **51**, 502–6 (1972). Two trials were conducted to determine if varying dietary levels of oil would affect xanthophyll deposition in broiler skin. The birds in both trials were fed either 4, 7 or 10% oil in the diet which provided 2.17, 2.35 and 2.53 Cal. M.E./mg, of xanthophyll, respectively. These rations were fed ad libitum from one day of age until they were sacrificed at 8 weeks of age for birds in trial 1 and 7 or 8 weeks of age for those in trial 2. Skin samples were taken from the breast and back of each bird, extracted with acetone and the xanthophyll content determined. The lipid from each sample was extracted with a chloroform-methanol mixture and weighed. The increase in dietary oil in the rations of this experiment did result in significant increases in xanthophyll deposition in the back skin for both 7 and 8 week old birds. More xanthophyll was deposited per gram of tissue as the percentage of dietary oil increased. The carcass weight and tissue lipid also increased as dietary oils were increased.

THE INTERACTIONS BETWEEN DIETARY SAPONIN, CHOLESTEROL AND RELATED STEROLS IN THE CHICK. B. Morgan, Monique Heald, S.G. Brooks, J.L. Tee and J. Green (Beecham Res. Labs., Nutr. Res. Center, Walton Oaks, Tadworth, Surrey, England). *Poultry Sci.* **51**, 677–82 (1972). One week-old chicks were fed a basal semi-synthetic diet, with and without cholesterol (0.5%), for 3 weeks and the effects of digitonin (0.25%) and *Gypsophila* saponin (0.25%) on growth and serum cholesterol were examined. Digitonin and *Gypsophila* saponin both depressed growth and the depression was reversed to a large extent, but not totally, by dietary cholesterol. These two saponins lowered serum cholesterol in chicks fed either the basal diet or the cholesterol-containing diet. Chicks fed the cholesterol-containing diet supplemented with digitonin or *Gypsophila* saponin were dosed orally with cholesterol-4-^{14}C. Neither of the saponins affected the amount of radioactivity found in the lipids of liver or serum 3 or 21 hr. after dosing. Neither 3β-hydroxy-5β-cholestanol nor 3α-hydroxy-5β-cholestanol reversed the growth depression caused by digitonin or *Gypsophila* saponin. These results are discussed in the light of the suggestion that cholesterol complexes with saponins in the gastro-intestinal tract.

FAILURE OF VITAMIN SUPPLEMENTATION TO ALTER THE FATTY LIVER SYNDROME CAUSED BY AFLATOXIN. P.B. Hamilton and J.D. Garlich (Dept. of Poultry Sci., N.C. State Univ., Raleigh, N.C. 27607). *Poultry Sci.* **51**, 688–92 (1972). A mixture of choline, inositol, vitamin B_{12} and vitamin E has been reported to cure the fatty liver syndrome of laying hens, but the inability to reproduce this syndrome in the laboratory has prevented controlled evaluation of the proposed cure. Since dietary aflatoxin causes reproducibly in the laboratory a fatty liver syndrome, an experiment was designed to establish whether the vitamin mixture was effective in treating the syndrome caused by aflatoxin. Hens selected for similar age, weight, and egg production were used in a 2 × 2 factorial experiment for the presence and absence of the added dietary vitamins and 10 μg/g aflatoxin. After three weeks the aflatoxin caused a significant increase in liver size, liver total lipid and percent of egg as shell and a decrease in egg production while the added vitamins were without effect on these parameters. Half of the birds which had received aflatoxins were placed on the control diet while the other half were fed the control diet supplemented with the vitamin mixture. In three weeks, all parameters returned to control

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• Report from Belgium...

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investigation was to find a cheap source of proteins, to valorize waste products from the palm oil mills, and to offer an interesting solution for pollution problems in the palm oil producing countries. The investigations have been carried out on laboratory scale with a *Candida lipolytica* strain (BP, Lavera).

The oxidative degradation of fatty acids by *Candida lipolytica* and *tropicalis* has also been studied. A significant specificity for long chain fatty acids was observed (C_{12} to C_{18}). C_4 to C_{10} fatty acid chains are not metabolized, and, moreover, C_8 and C_{10} chains exert an inhibitive action.

At the Institut de Recherches of CERIA the regulation of the biological control of the catabolism of fatty acids was studied with *Escherichia coli*. Also the effects of the perturbation of the control factors on the physiology of the bacterial cell were studied. ■

values and the added vitamins had no significance on the recovery. These results suggest that the proposed vitamin mixture is not effective in altering the development or enhancing the recovery from the fatty liver syndrome caused by aflatoxin.

MACROMOMYCIN, AN INHIBITOR OF THE MEMBRANE FUNCTION OF TUMOR CELLS. T. Kunimoto, M. Hori and H. Umezawa (Inst. of Microbial Chem., Shinaga-ku, Tokyo, Japan). *Cancer Res.* 32, 1251–6 (1972). Macromomycin, a proteinaceous antitumor antibiotic, binds to the membrane of tumor cells and thereby preferentially inhibits DNA synthesis. The cytotoxicity could be abolished by removal of macromomycin from the binding locus by a brief treatment with trypsin.

PHYTOSTEROLS IN NORMAL AND TUMOR-BEARING RATS. W.R. Nes, N.S. Thampi and J.T. Lin (Dept. of Biol. Sci., Drexel Univ., Philadelphia, Penn. 19104). *Cancer Res.* 32, 1264–6 (1972). The typical phytosterols, 24-methyl- and 24-ethylcholesterol, were isolated from a Morris rat hepatoma as well as from normal rat liver. They represented 1% of the total sterol in both normal and cancerous cases. When rats bearing the hepatoma were given injections of 22,23-$^3H_2$-24-ethylcholesterol, 15% of the labeled sterol was subsequently found distributed between the normal liver, the hepatoma, and the remaining carcass. The deposition of injected cholesterol-4-^{14}C was also demonstrated, and greater incorporation of label (85%) indicated a slower turnover rate than for the phytosterol. The radioactive 24-ethylcholesterol did not lead to incorporation of label into cholesterol or into any other observable sterol. Since the phytosterols found in the liver and hepatoma corresponded to the most common of the plant sterols, and since one of them (the 24-ethyl derivative) was experimentally depositable, they are presumably of dietary origin.

THE SIZE AND NUMBER OF POLYPEPTIDE CHAINS IN HUMAN SERUM LOW DENSITY LIPOPROTEIN. R. Smith, J.R. Dawson and C. Tanford (Dept. of Biochem., Duke Univ. Med. Center, Durham, N.C. 27710). *J. Biol. Chem.* 247, 3376–81 (1972). Human low density lipoprotein (LDL) was prepared by successive ultracentrifugations of serum at different densities. Apo-LDL, prepared by delipidation of LDL by successive extractions with ethanol-ether and ether, was reduced and carboxymethylated in 7 M guanidine hydrochloride. The molecular weight of apo-LDL was determined by three methods: sodium dodecyl sulfate-polyacrylamide gel electrophoresis, equilibrium ultracentrifugation in 7.6 M guanidine hydrochloride, and Sepharose 4B gel filtration in 6 M guanidine hydrochloride. The molecular weights, as determined by the first two methods, were 255,000 ± 10% and 250,000 ± 5%, respectively. As the polypeptide eluted close to the void volume on the gel filtration column only a range of 275,000 ± 15,000 can be established for its molecular weight. However, significantly, these chromatographic experiments indicated the absence of smaller components. The data provide evidence that only two polypeptide chains, of equal size, can be found in LDL (native molecular weight 2.7×10^6, 20% protein by weight), and that these chains are not aggregates of smaller polypeptide chains.

ARTIFICIAL SUBSTRATES IN SQUALENE AND STEROL BIOSYNTHESIS. A. Polito, G. Popjak and T. Parker (Depts. of Biol. Chem. and Psychiatry, Ment. Retard. Center, Schl. of Med., Univ. of Cal. at Los Angeles, L.A., Cal. 90024). *J. Biol. Chem.* 247, 3464–70 (1972). *Trans*-3-methylpent-2-enyl-1-$^3H_2$ pyrophosphate and isopentenyl-1-^{14}C pyrophosphate were incubated with 10,000 × *g* supernatants of rat liver homogenates. Analyses of the unsaponifiable material extracted from the incubations by gas-liquid radiochromatography and mass spectrometry revealed the synthesis not only of squalene-^{14}C but also of 1-methylsqualene-^3H,^{14}C and of 1,24-dimethylsqualene-^3H,^{14}C. The sterol fraction of the unsaponifiable extracts contained two components labelled with ^3H and ^{14}C, the ^3H:^{14}C ratios of which were identical with the isotope ratios of the 1-methylsqualenes and which had retention volumes in gas-liquid chromatography expected of 27-methylcholesterol and of 27-methyllanosterol. The sterol fractions did not contain components that might have been derived from the cyclization of 1,24-dimethylsqualene. It is suggested that 1-methylsqualene is epoxidized enzymically only at its isopropylidene end, but not at its isobutylidene end.

ON THE METABOLISM OF PROSTAGLANDINS E_1 AND E_2 IN THE GUINEA PIG. M. Hamberg and B. Samuelsson (Dept. of Med. Chem., Royal Vet. College, S-104 05 Stockholm 50, Sweden). *J. Biol. Chem.* 247, 3495–3502 (1972). 5β,7α-Dihydroxy-11-ketotetranorprostanoic acid was the major metabolite excreted in the urine of guinea pigs injected with tritium-labeled prostaglandin E_1, prostaglandin E_2, 11α,15L-dihydroxy-9-ketoprost-5-enoic acid, 11α-hydroxy-9,15-diketoprostanoic acid and 11α-hydroxy-9,15-diketoprost-5-enoic acid. A method was developed for quantitative determination of 5β,7α-dihydroxy-11-ketotetranor-prostanoic acid in 24-hour samples of guinea pig urine. The basal excretion of the metabolite in 10 male guinea pigs was 1.34 to 2.74 μg per kg of body weight × 24 hours. Administration of 50 mg of indomethacin per day inhibited the excretion of the urinary metabolite by about 98%.

THE BIOSYNTHESIS OF UNSATURATED FATTY ACIDS BY BACILLI. III. UPTAKE AND UTILIZATION OF EXOGENOUS PALMITATE. A.J. Fulco (Lab. of Nuclear Med., and Radiation Biol., Univ. of Cal., Los Angeles, Cal. 90024). *J. Biol. Chem.* 247, 3503–10 (1972). The factors affecting the uptake, utilization and desaturation of exogenous palmitic acid by *Bacillus megaterium* 14581 have been elucidated and the validity of the in vivo assay for determining the relative levels of the temperature-induced Δ^5-desaturating enzyme system in this organism has been established. It was found that, in the presence of glucose, palmitic acid-1-^{14}C added to the cultures of *B. megaterium* is taken up rapidly and quantitatively by the cells. However, most of the ^{14}C-label is excreted back into the medium within 15 min as water-soluble products (CO_2, acetate, etc.) presumably derived from β oxidation of the added palmitate-1-^{14}C. The remaining palmitate-1-^{14}C (about 30% of the amount added) mixes with a small endogenous pool of palmitate (approximately 35 mμ moles per g of cells) which is readily desaturated but is completely stable to β oxidation.

IV TEMPERATURE-MEDIATED CONTROL MECHANISMS. *Ibid.*, 3511–19. Three control mechanisms have been demonstrated in *Bacillus megaterium* which regulate the level of Δ^5-desaturating enzyme, and hence the rate of unsaturated fatty acid biosynthesis, in response to temperature changes in the growth or incubation medium. One control process mediated by temperature is that of desaturase induction. A culture growing at 35C does not synthesize unsaturated fatty acids. When the culture is transferred to 20C, however, the synthesis of desaturase begins and continues at an accelerating rate for at least 1 hour. The induction process is blocked by chloramphenicol and the evidence suggests that both the desaturase synthesizing system and the desaturase itself are absent in cultures growing at 35C and must be induced at 20C by a process requiring protein synthesis.

INTERACTION OF GLUCOCORTICOIDS WITH GLUCAGON AND EPINEPHRINE IN THE CONTROL OF GLUCONEOGENESIS AND GLYCOGENOLYSIS IN LIVER AND OF LIPOLYSIS IN ADIPOSE TISSUE. J.H. Exton, Naomi Friedmann, Ellen Hee-Aik Wong, J.P. Brineaux, Jackie D. Corbin and C.R. Park (Dept. of Physiol., Vanderbilt Univ., Nashville, Tenn. 37232). *J. Biol. Chem.* 247, 3579–88 (1972). The effects of glucagon and epinephrine on gluconeogenesis and glycogenolysis in liver and of catecholamines and adrenocorticotrophic hormone on lipolysis in adipose tissue were examined in normal and adrenalectomized rats. Glucagon or epinephrine stimulation of glucose synthesis from lactate was markedly reduced in isolated perfused livers from fasted, adrenal-deficient rats. Administration in vivo of the glucocorticoid dexamethasone 30 min prior to perfusion restored the gluconeogenic response to glucagon. Cortisol and dexamethasone were also effective when added to the perfusion medium, but had no effect in the absence of glucagon. These studies indicate that adrenal glucocorticoids are required for normal activation of gluconeogenesis, glycogenolysis, and lipolysis by epinephrine and other hormones.

SPECIFICITY OF LONG-CHAIN ACYL COENZYME A SYNTHETASE FROM RAT LIVER MICROSOMES. INFLUENCE OF THE POSITION OF DOUBLE BONDS IN OCTADECADIENOIC ACIDS. G. Suzue and Yves L. Marcel (Clin. Res. Inst. of Montreal, 110 Pine Ave. West, Montreal 130, Quebec, Canada). *Biochemistry* 11, 1704–8 (1972). The activation of linoleic acid 18:2 (n-6), and of four of its cis,cis isomers 18:2(n-5), 18:2(n-7), 18:2(n-8), and 18:2(n-9) by rat liver microsomes has been studied by a method of assay based on the insolubility of linoleyl-CoA in diethyl ether. Under optimum concentrations of cofactors for the activation of linoleic acid, the kinetics of activation of the different octadecadienoic acids were investigated. Linoleic acid had the lowest K_m (2.22 μM) and the displacement of its double bonds by one atom of carbon either toward the carboxylic group or toward the methyl group caused the K_m to increase by a factor of 10:20 μM for both 18:2(n-5) and 18:2(n-7). Further displacement of the double bonds toward the carboxylic group caused the K_m to decrease: 7.14 and 3.33 μM for 18:2(n-8) and 18:2(n-9), respectively. Thus the lowest K_m were found for 18:2(n-6) and 18:2(n-9), and the greater affinity of the enzyme for these two substrates was tentatively attributed to the Δ^9 double bond which is common to both fatty acids. The influence of the Δ^9 double bond on the specificity of long-chain acyl-CoA synthetase was further supported by the results of the inhibition study of linoleic acid activation by 18:2(n-7) and 18:2(n-9); 18:2(n-7), which has its double bonds in $\Delta^{8,11}$, is a mixed-type inhibitor of the reaction whereas 18:2(n-9), which has its double bonds in $\Delta^{6,9}$, behaves more like a competitive inhibitor.

EFFECT OF FAT LEVEL IN ISONITROGENOUS DIETS ON THE COMPOSITION OF AVIAN PANCREATIC JUICE. H.W. Hulan and F.H. Bird (Dept. of Animal and Vet. Sci., Univ. of Maine, Orono, Me. 04473). *J. Nutr.* 102, 459–68 (1972). Each of 12 male commercial-strain chickens was prepared with a permanent cannula of the main pancreatic duct. Two groups of six birds were fed diets containing 14.5% or 4.5% fat for three 4-day periods in two dietary sequences in a double reversal experimental design. All chickens were continued for a post-experimental period of 9 days and were fed the diet they were receiving on day 12 of the experimental period. The continous secretion of pancreatic juice was collected daily, frozen and stored at −20C. All samples of pancreatic juice were analyzed for total protein content, and for lipase, amylase, trypsin and chymotrypsin activity. The level of specific lipase in the pancreatic juice was significantly ($P < 0.01$) augmented by increasing the dietary fat intake. The enzyme activity data for the postexperimental period substantiated the observations of the 12-day experimental period.

COMPLEXES OF PROTHROMBIN WITH CALCIUM IONS AND PHOSPHOLIPIDS. R.K. Bull, S. Jevons and P.G. Barton (Dept. of Biochem., Univ. of Alberta, Edmonton 61, Alberta, Can.). *J. Biol. Chem.* 247, 2747–54 (1972). The ability of phospholipids to bind prothrombin in the presence of Ca^{2+} ions has been studied as a function of lipid composition. Two distinct but complementary methods have been devised to evaluate binding. The first method involves gel filtration on Sephadex G-200 at pH 9.0 to separate the lipid-bound and free prothrombin; the second involves precipitation of the complexes at pH 6.5. Phosphatidylcholine (PC) or a mixture of this lipid with phosphatidylethanolamine (PE) bound very little prothrombin, whereas mixtures of phosphatidylserine (PS) with PC were very effective in binding and the complexes that formed were highly active in the one-stage prothrombin assay. PS alone, phosphatidic acid (PA) alone, PA-PS mixtures, and PA-PC mixtures containing high proportions of PA, bound prothrombin very effectively, but the complexes formed were much less active than when PS-PC was used. Bound protein could be much more readily removed from PS-PC than from PS-PA by treatment of the complexes with EDTA. It was suggested that an optimal surface condition is required to bind reversibly prothrombin prior to conversion to thrombin. Anticoagulant effects ascribed to acidic phospholipids may be due to irreversible binding of the clotting factors to lipid surfaces.

THE ASSOCIATION OF PHOSPHATIDYLSERINE SYNTHETASE WITH RIBOSOMES IN EXTRACTS OF ESCHERICHIA COLI. C.R.H. Raetz and E.P. Kennedy (Dept. of Biol. Chem., Harvard Med. School, Boston, Mass. 02115). *J. Biol. Chem.* 247, 2008–14 (1972). The biosynthesis of phospholipids in *Escherichia coli* is catalyzed by enzymes most of which are associated with the bacterial membrane. In the present work, it has been found that the enzyme CDP-diglyceride:L-serine phosphatidyltransferase (phosphatidylserine synthetase) is exceptional in that it is not bound to membrane fragments in cell-free extracts of *E. coli*, but is predominantly associated with ribosomes. The enzyme resists extraction from ribosomes in buffers containing low concentrations of magnesium, the enzyme was associated with both 50 and 30 S subunits. Phosphatidylserine is found only in trace amounts in *E. coli*, being rapidly converted to phosphatidylethanolamine by a decarboxylase which is a membrane-bound enzyme. Despite the apparently different intracellular localization of the two enzymes, their function in vivo must be tightly coupled. When the decarboxylase in living cells of *E. coli* was inhibited by the addition of hydroxylamine to the medium, phosphatidylserine-$1\text{-}^{14}C$ was shown to accumulate within 1 min. In the control cells, in which the decarboxylase was not inhibited, no labeled phosphatidylserine could be detected, showing that the decarboxylation of the newly formed phosphatidylserine must take place without detectable time lag.

STRUCTURAL STUDIES BY X-RAY DIFFRACTION OF MODEL PHOSPHOLIPID-INSULIN MEMBRANES. R.P. Rand and S. SenGupta (Dept. of Biol. Sci., Brock Univ., St. Catharines, Ontario, Canada). *Biochemistry* 11, 945–9 (1972). X-Ray diffraction studies were made on precipitates formed at pH 3.0, between insulin and mixtures of lecithin (L) and the acidic phospholipid cardiolipin (CL) of mole ratios L:CL from 97:3 to 50:50. The precipitates are single lamellar phases, made up of alternating layers of lipid-protein and water, whose repeat distance *d* is constant at approximately 69 A. For L:CL from 97:3 to 50:50 the composition of the precipitates varies systematically, showing no stoichiometry, the weight per cent lipid being 51% and the protein increasing from 8 to 37% as the water decreases from 41 to 15%. The CL:insulin ratio increases however to a constant value of approximately 5. Molecular packing, based on partial thicknesses of the lipid, protein, and water, indicates that the phospholipid bilayer that exists without bound protein is unperturbed when insulin is electrostatically bound to it and no subsequent apolar interactions occur, *i.e.*, insulin does not penetrate into the lipid bilayer. As more insulin is bound to the lipid it simply replaces water in the interbilayer space.

• Drying Oils and Paints

URETHANES BASED ON VEGETABLE OILS. J.P. Misra and M.A. Sivasamban. *Paint Manuf.* 41 No. 12, 30–2 (1971). Present studies indicate that the hydroxyl value of the alcoholysed product of the oil is a controlling factor in actual film performance. Among the oils investigated, the urethanes derived from dehydrated castor oil had by far the best film properties. The dehydrated castor oil urethanes had high viscosity but this difficulty was overcome by using blends of dehydrated castor oil and linseed oil for glycerolysis. The urethanes from these glycerolysed products had satisfactory viscosity and film properties. (World Surface Coatings Abs. No. 358)

MALAWI TUNG OIL VARNISHES FOR PRESETVATION OF TIMBER. H.W. Chatfield. *Polymers, Paint Col. J.* 160 No. 3808, 647–8 (1971). Malawi tung oil/phenolic resin medium appears to accommodate an interesting spectrum of anti-rot or insecticidal additives, in significant amount, without apparent detriment to normal properties, and it may thus form the basis of multi-purpose anti-rot, insecticidal, clear decorative varnish for timber. The colour retention may be influenced by choice of phenolic resin. (World Surface Coatings Abs. No. 358)

TALL OIL FATTY ACIDS IN PAINT PRODUCTION. S.I. Loginov. *Lakokras. Mat.* 1971, No. 4, 2–3. Some problems, and the expansion and economics of the use of tall oil distilled fatty acids in paints are discussed. (World Surface Coatings Abs. No. 358)

IN SITU PROCESS FOR TRANS-ISOMERIZATION AND CONJUGATION OF RESINS CONTAINING FATTY ACID ESTERS. L.O. Cummings (Pacific Vegetable Oil Corp.). *U.S. 3,668,159.* A method is provided for producing resins or esters from starting esterifiable components and polyunsaturated, nonconjugated fatty acids. The mass is heated with SO_2 gas to effect conjugation in situ and also rearrangement to provide increased amounts of isolated trans double bonds. The esterifiable components are suitably epoxy resins or alkyd-forming mixtures.

• Detergents

Differences in ultracentrifugal stability of various oil-in-water emulsions. R.D. Vold and K.L. Mittal (Dept. of Chem., Univ. of So. Cal., Los Angeles, Cal.). *J. Soc. Cosmet. Chem.* 23, 171–88 (1972). Studies of Nujol-water and olive oil-water emulsions stabilized with sodium dodecyl sulfate, cetyl pyridinium chloride, Tween 20 or Triton X-100 show that generally the rate of separation of oil in an ultracentrifuge decreases with time of centrifugation, approaching zero at sufficiently long times. The marked differences in behavior of these systems suggest that the chemical nature of the oil and of the surfactant, and the molecular geometrical compatibility, may be more important than such general characteristics as viscosity and interfacial tension.

Rapid screening of preservatives. M.S. Parker (Dept. Pharm. Technol. School Pharm. Sciences, Univ. of Strathclyde, Glasgow, Scotland). *Soap, Perfumery Cosmet.* 45, 103–9 (1972). Rapid screening of preservatives may be achieved by selecting some index of cell development which occurs early in the growth cycle and is susceptible to such agents. Inhibitary effects can be monitored by various instruments. Examples described are the spectrophotometer to measure optical density changes associated with spore development and vegetative cell division; and the Coulter Counter for automatic size analysis of germinating spores.

Clinical evaluation of two shampoos in the treatment of seborrheic dermatitis. N. Orentreich (Orentreich Med. Group, 909 Fifth Ave., New York, N.Y. 10021). *J. Soc. Cosmet. Chem.* 23, 189–94 (1972). The relative efficacies of a commercially available zinc pyrithione shampoo; a commercially available sulfur, salicylic acid and hexachlorophene shampoo; and a control shampoo in the "over the counter" treatment of frank seborrheic dermatitis were measured using a visual technique. Both the zinc pyrithione shampoo and the shampoo based on the combination of active ingredients produced better results than the unmedicated control shampoo. Further, the zinc pyrithione shampoo was significantly more effective in controlling this disease process than the shampoo containing the combination of active ingredients. A supplementary evaluation of the relative efficacies of the test products in suppressing itching of the scalp also indicated the zinc pyrithione product to be superior; however, the data do not give any evidence of better long-term reduction of scalp oiliness with this shampoo compared to the other active ingredient shampoo.

Determination of the molecular weight distribution of polyether surfactants. N. Kalish, L. Weintraub and M. Kowblansky (Res. & Devmt. Labs., Bristol-Myers Products, 1350 Liberty Ave., Hillside, N.J. 07207. *J. Soc. Cosmet. Chem.* 23, 153–63 (1972). Many of the characteristics important in formulating with polyether surfactants are dependent on molecular weight distribution. Determination of a commercial quaternary ammonium polyether surfactant is reported. The intermediate tertiary aminopolyether alcohol which contains polypropylene glycol as a by-product has a distribution identical to that of the quaternary products and was used in the analyses. The amine and glycol fractions were separated by esterification of the mixture, which permits partitioning of the esterified amine and glycol fractions into different solvents. The makeup of each fraction was determined by integrated programmed gas chromatography. In addition, the aminopolyether fraction was analyzed by a combination of mass spectroscopy and nuclear magnetic resonance. The amine fraction was found to have a symmetrical distribution of molecular weights, while the glycol fraction had more high molecular weight components. This method for determination of the weight distribution is readily adapted to other polyether surfactants.

Absorption and desorption of cosmetic chemicals on skin. E. Jungermann and H.C. Silberman (Armour-Dial, Inc., Chicago, Ill. 60680). *J. Soc. Cosmet. Chem.* 23, 139–52 (1972). Stratum corneum in the form of excised callus was used to measure the effect of various aqueous solutions on skin. Pieces of callus were immersed in distilled water, in organic solvents and in aqueous solutions of detergents, humectants, and soaps for different lengths of time. The weight increases were compared with the increases obtained by water alone. Repetitive soaking of callus in the same solution, alternating with air-drying was investigated. The results allow a discussion of the factors which influence the water content of skin and the conservation of this water.

The effect of nonionic surfactants on the ultrasonic dispersing of phthalocyanine blue. K. Nukina, Y. Toyoshima and S. Ueno (Dainippon Ink Inst. of Chem. Res., Saitama, Japan). *Kolloid-Z. u. Z. Polymere* 250, 116–9 (1972). Relationships between the dispersibility and the factors affecting the stability of phthalocyanine blue suspensions in the aqueous medium in the presence of polyoxyethylene nonylphenol ethers were studied. Phthalocyanine blue (1%) was ultrasonically irradiated with the addition of polyoxyethylene nonylphenol ethers of varying ethylene oxide content, and effects of concentration of the surfactants, ethylene oxide addition numbers (for HLB), zeta potential and heat of wetting were investigated. It was shown that the increase of the value of zeta potential does not necessarily improve the dispersibility of the pigment, but above 12 erg/cm^2, the heat of wetting is linearly related as a whole to the dispersibility except for $C_9EO_{7.5}$, which shows an abnormal frequency distribution curve.

Builders and supplementaries in detergents. Th. Kunzmann. *Seifen-Öle-Fette-Wachse* 98, 179–81 (1972). Detergents which are composed of synthetic surface active substances need admixture of builders for full effectiveness. The modes of action of phosphates, CMC, silicate and carbonates are discussed.

Emulsifiers in cosmetic emulsions. K.-G. Ludwig (Atlas Chemie GmbH, Essen, Germany). *Seifen-Öle-Fette-Wachse* 98, 224–6 (1972). Discussed are the HLB-value and the limits of its applicability. Treated in detail are the nonionic emulsifers and their use at w/o- and o/w-emulsions.

Modifications of the methods for production of alkylbenzenes. D. Gasztych et al. *Tluszcze, Srodki Piorace, Kosmet.* 15(5), 3–15 (1971). The alkylation of benzene with higher chlorinated alkanes and of C_{10}–C_{12} α-olefins in the presence of aluminium trichloride complexes was studied. In both cases, the reaction rates were elevated. With the α-olefins, the reaction was completed in a few seconds whereas the chlorinated products required 1 minute. Thermodynamic calculations showed that the heat of reaction for the alkylation of benzene with higher olefins is about 18–20 kcal/mole, while for the alkylation of benzene with chlorinated alkanes, it is about 2.5–5 kcal/mole. (Rev. Franc. Corps Gras)

Polysilicates as detergent builders. H. Weldes (Philadelphia Quartz Co.). *Soap, Cosmetics, Chem. Specialties* 48(5), 72–80, 96–8 (1972). A discussion of the chemistry and applications of hydrous sodium polysilicates is presented. These compounds may be used as partial or total replacements for phosphates. Since they are less alkaline than metasilicates, the polysilicates are less effective as sources of alkaline reserve. However, in soil deflocculating and dispersing, and in emulsification, they are more effective than the metasilicates. They are also more compatible with water hardness ions and possess good corrosion inhibition properties.

Saginaw detergent study. W.J. Beach. *Soap, Cosmetics, Chem. Specialties* 48(4), 29–32, 48 (1972). This article contains the results of a study carried out in Saginaw Township, Michigan to determine how much phosphate is removed from the municipal sewage system if phosphate-containing detergents are not used to wash clothes and dishes. As a result of elimination of these detergents, 26.6% of the total phosphorus, representing 39.6% of the dissolved phosphorus, was removed from the waste stream. The conclusion was that this level of reduction was too small to yield a significant

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Classified Advertising

• Abstracts...

(Continued from page 357A)

economic advantage either in plant operation or in capital expenditures. Consumer reactions to these products are also given.

LAUNDRY DETERGENTS SCREENED FOR BIODEGRADABILITY. Anon. *Soap, Cosmetics, Chem. Specialties* 48(4), 42–4 (1972). The results of a series of screening tests carried out by the French Atomic Energy Commission on commercial laundry detergents are given. A rapid biodegradability test (48 hours) was used and found to be satisfactory. Only 8 of the 41 products tested satisfied the minimum biodegradability requirement of 80%.

COLORIMETRIC DETERMINATION OF CARBOXYMETHYLCELLULOSE. G. Kunovits (F. Hoffmann-La Roche & Co. AG, Basel, Switzerland). *Seifen-Öle-Fette-Wachse* 98(9), 250 (1972). Described is a simple and easily practicable determination with good accuracy using thioglycolic acid.

NONIONIC SURFACTANTS. IV. SURFACE AND MICELLAR PROPERTIES OF TERPENE ETHERS OF POLYETHYLENE GLYCOLS. St. Kucharski (Inst. of Organic and Plastics Tech., Tech. Univ., Wroclaw, Poland). *Koll.-Z. u. Z. Polymere* 250, 231–3 (1972). The surface and micellar properties of terpene ethers of polyethylene glycols containing 6 to 12 oxyethylene units were described. By employing the Gibbs' adsorption equation the surface area per molecule in the surface adsorption layer was calculated. The isotherms of surface tension vs. concentration enabled the evaluation of critical micelle concentrations, enthalpy and entropy of micelle formation. Also, the relation between cloud point and concentration was described.

TOILET SOAPS BY COLD SAPONIFICATION. T. Kunzmann. *Seifen-Öle-Fette-Wachse* 98(9), 247–8 (1972). The manufacture of toilet soaps and use of various raw materials is described.

DETERGENT FORMULATIONS. M.T. Yang (Ethyl Corp.). *U.S. 3,637,511.* The nonphosphorus detergent builders provided are the water soluble salts of N,N-di(carboxymethyl)-aspartic acid (*e.g.*, the tetrasodium salt). Synthesis of the builders is described. ■

• Meetings...

(Continued from page 331A)

borough, Ont., Canada.

Nov. 28–30, 1972–Second International CAMAG Symposium on Thin Layer Chromatography and Electrophoresis, Park Sheraton Hotel, New York. Contact: Program Director, CAMAG, Inc., 2855 S. 163 St., New Berlin, Wis. 53151.

June 20–27, 1973–Alchema '73 and the European Meeting of Chemical Engineering, Frankfurt/Main, Germany

July 2–6, 1973–Second Congress of the *Association Internationale de la Couleur,* University of York, England.

October 29–November 2, 1973–Fourth International Conference on Atomic Spectroscopy, Toronto, Ontario, Canada. ■