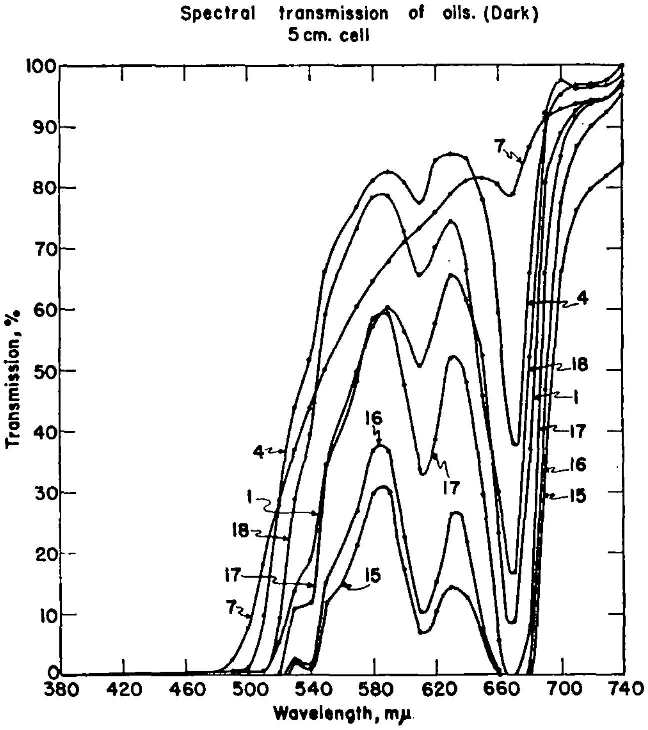
read transmissions at 430 and 480 in a 13-mm. rectangular cell. Their data fit the curve Lovibond red = 6.34 — T/28, where T is the sum of transmissions at 430 and 480 in the 15-mm. rectangular cell.

At Swift and Company they have been working on a scheme that will enable them to grade fats and oils over a wide range of color. For this purpose it is necessary to have readings at three points in the spectrum as dark tallows do not transmit much light below 600. The transmissions selected by Swift were 400, 540, and 670 mμ, the readings being made on a 19-mm. tube. The sum of the three is called color index. A water white oil will have a color index of 400 and a dark tallow (FAC 45) will have a color index of 4.

It seems certain that the spectrophotometer can be used to give values that are proportional to Lovibond red colors. The correlation will not be exact, but that is due to the fact that Lovibond red values are erroneously low on oils containing green. The spectrophotometric values will need to be obtained on not more than 3 wave lengths and will represent the color value of the oil better than Lovibond red. Further work is being done to arrive at a system that will work for all vegetable oils and can be recommended for general use. However, it should be kept in mind that official trading values will have to be determined with Lovibond glasses.

PROCTER THOMSON.


Spectral transmission of oils. (Dark)
5 cm. cell

Dark

Abstracts

Oils and Fats

Edited by
M. M. PISKUR and SARAH HICKS

CERAMIC CHEMICAL LININGS IN THE OIL, FAT, AND SOAP INDUSTRY. L. Kogel. *Fette u. Seifen 51,* 455-8 (1944).

SOLVENT EXTRACTION OF COTTONSEED AND PEANUT OILS. IV. PILOT PLANT BATCH EXTRACTIONS. J. Pominski, L. J. Molaison, A. J. Crovetto, R. D. Westbrook, E. L. D'Aquin, and W. F. Guilbeau (Southern Regional Research Lab., New Orleans, La.). *Oil Mill Gaz. 51,* No. 12, 33-9 (1947). A portable batch solvent extraction and apparatus used at the authors' laboratory are described in detail. Some data on the use of this plant for extraction of cottonseed, okra seed, and rice bran oil are tabulated. Hexane and Et ether were the solvents used. (*Chem. Abs.*)

REPORT OF PROGRESS OF A STUDY OF FACTORS AFFECTING THE PRESSURE EXTRACTION OF COTTONSEED OIL. W. H. Baskervill, J. A. Glass, and A. H. Morgan (Eng. Expt. Sta., Knoxville, Tenn.). *Oil Mill Gaz. 51,* No. 11, 56-63 (1947). The tests were made on flaked meats of 7% moisture, cooked in a laboratory cooker, pressed in a cylinder, cylinder jacket was at 200° F., and pressures were to 2500 lb. per sq. in. As cooking temperatures of 15 min. cook increased from 5 to 45 lb. per sq. in. steam pressure the oil content of the pressed cake decreased to a minimum of 4%. Moisture content of cake varied from 2.5 to 8% as the steam pressure of cooking meats increased from 5 to 60 lb. (temperature of meats 275 to 315° F., respectively). The pressing times in minutes, when plotted on log-log coordinates against oil remaining in cake, fell in a straight line. The results on effect of cake thickness indicated there was no advantage in decreasing thickness of cake below common oil mill practice. Increasing pressing time from 30 to 60 min. decreased oil in the cake from 5.2 to 4.4%. All the data are represented graphically. (*Chem. Abs.*)

FUMARIC ACID AS AN ANTIOXIDANT FOR FATS. E. Glimm and M. Rozdilskyj. *Fette u. Seifen 54,* 389-91 (1944). Fumaric acid was inactive as an antioxidant on several vegetable oils and butter. This is contrary to American reports.

INHIBITING OILY TASTE OF BUTTER BY REGULATION OF THE PH. Nis Petersen (Egernsund, Danemark). *Fette u. Seifen 51,* 440 (1944). Improvement in keeping quality of butter by buffering with the AIV-butter salts developed by Virtanen has been confirmed by tests in Sweden.

DEVELOPMENTS IN THE KNOWLEDGE OF SPOILAGE OF BUTTER. F. Kieferle and Charlotte Feichtner. *Fette u. Seifen 51,* 427-30 (1944). Butters preserved with boric acid, Na benzoate and a hypochlorite rinse were compared with controls in storage tests at 3-5° and at 10-12°, using various deterioration criteria. Spoilage reaction did not agree closely to organoleptic observations. Boric acid and Na benzoate markedly inhibited ketonic rancidity; hypochlorite rinses were only slightly active in this respect.

STANDARD METHODS FOR ANALYSIS IN THE FAT AND WAX INDUSTRIES. III. CHEMICAL CHARACTERISTICS. I. H. P. Kaufmann and H. J. Heinz. *Fette u. Seifen 51,* 258-67 (1944). The publication includes: fatty acids; saponification, ester, lower fat acid, R.-M.

Polenske, Kirschner, butyric acid, residue, I, SCN, hydrogenation I, partial I, diene, polybromide, (OH), and carbonyl nos., and interpretation. IV. CHEMICAL CHARACTERISTICS. II. H. P. Kaufmann. *Ibid.* 309-11. The methods described are: micro saponification, Kaufmann I, acid, diene, SCN, (OH) nos.: and determination of the saturated constituents.

PHYSICAL AND CHEMICAL METHODS FOR CHARACTERIZING PEANUT BUTTER. J. F. Vincent (Georgia State Coll. for Women, Milledgeville). *Anal. Chem. 19,* 655-7 (1947). A penetrometer procedure is used to evaluate spreadability. Particle size of peanut butter is measured by extracting the sample with hot benzene, drying the residue and subjecting it to a Ro-tap sieve test. Content of hydrogenated oil is approximated from the flow point of the extracted oil. Air content is determined with special apparatus. Sucrose is determined by a modified Lane-Eynon method and salt by the Mohr procedure.

ADSORPTION AND ITS APPLICATION IN THE FAT FIELD. H. J. Heinz. *Fette u. Seifen 51,* 448-54 (1944). A review.

STANDARD ANALYTICAL METHODS FOR THE FAT AND DETERGENT INDUSTRY. A. Lottermoser. *Fette u. Seifen 51,* 391-7 (1944). Physical tests are given: specific gravity, color, index of refraction, flow, drop, melting, solidification, titer, stock, flame and fire points, viscosity, absorption spectra. *Ibid.* R. R. Wefelscheid. *Ibid.* 398-401. Consistency of fat, water content, ash, soap, mineral and neutral fat content.

THE FREE FATTY ACIDS OF HUMAN HAIR FAT. A. W. Weitkamp, A. M. Smiljanic and S. Rothman (Standard Oil Co., Indiana). *J. Am. Chem. Soc. 69,* 1936-39 (1947). The free fatty acid fraction of human hair fat has been examined and found to contain normal saturated and unsaturated fatty acids, ranging in chain length from 7-22 C atoms. The normal saturated and unsaturated fatty acids having odd C contents appear to have been obtained from a natural source for the first time. The 6,7 position appears to be the characteristic location of the double bond in the unsaturated acids, although some 8,9 and other isomers are present. The unique character of most of the acids precludes the possibility of extensive extraneous origin.

THE CONFIGURATION OF NATURALLY OCCURRING MIXED GLYCERIDES. PART III. THE CONFIGURATION OF THE MAJOR COMPONENT GLYCERIDES OF PIQUI-A FRUIT-COAT FAT. M. L. Meara (Univ. Liverpool). *J. Chem. Soc. 1947,* 773-5. Piqui-a fruit-coat fat has been separated by crystallization into mono-oleo- and dioleoglycerides. The mono-oleoglycerides have been shown to consist of oleodipalmitin, no unsymmetrical isomer having been found. Low-temperature crystallization of the dioleoglycerides followed by crystallization of the hydrogenated derivatives has shown that both symmetrical and unsymmetrical palmitodioleins and palmito-oleolinoleins occur in this fat.

VEGETABLE OIL CONCENTRATES AS ANTIOXIDANTS FOR VITAMIN A IN FISH LIVER OILS. L. O. Buxton (Natl. Oil Products Co., Inc., Harrison, N. J.). *Ind. Eng. Chem. 39,* 1171-4 (1947). Stability data on antioxidant concentrates prepared from crude wheat germ, corn germ, and soybean oils by solvent extraction and tested in crude- and carbon-treated soup-fin shark liver and halibut liver oils, establish that such concentrates are highly effective antioxidants for inhibiting peroxidation and vitamin A destruction in such type oils. In all cases, and for the same percentage of vitamin A destruction, much lower peroxide numbers were observed in the oils containing the vegetable oil antioxidant concentrates than in the bland crude fish liver oils or carbon-treated oils.

STUDIES ON DETERIORATION OF VITAMIN A IN FISH LIVERS AND LIVER OILS. PART II. LOSS OF VITAMIN A POTENCY AND STABILITY IN FROZEN GROUND GRAYFISH LIVERS. D. Miyauchi (Fishery Tech. Lab., Seattle, Wash.). *Com. Fisheries Rev. 9,* No. 5, 7-9 (1947). There was no appreciable loss of vitamin A in grayfish livers stored for as long as 41 weeks at about —22.5°C. The free fatty acid content increased slightly and the relative stability of vitamin A decreased about 50% at 27 weeks in storage.

THE BIOTIN ACTIVITY OF A VACCENIC ACID FRACTION. A. E. Axelrod, K. Hofmann, and B. F. Daubert (Univ. Pittsburgh). *J. Biol. Chem. 169,* 761-2 (1947). Vaccinic acid like oleic and elaidic acids stimulates the growth of *Lactobacillus arabinosus* and *L. casei.*

STUDIES IN FETAL METABOLISM. W. H. Goldwater (Harvard Med. School, Boston) and D. Stetten. *J. Biol. Chem. 169,* 723-38 (1947). The feeding of deuterio fatty acids and deuteriocholesterol to pregnant rats in the latter part of gestation resulted in the appearance of the corresponding deuterio compounds in the fetuses, proving that these compounds cross the rat placenta. Enrichment of the body fluids of pregnant rats with D_2O resulted in the rapid incorporation of D into fetal glycogen, fatty acids, and cholesterol at rates indicating that these compounds are synthesized in the fetal organism. The data indicate that, in the rat fetus approaching the 20-day stage of development, half of the fetal glycogen had arisen by synthesis in 12-18 hours, half of the fetal fatty acids in about 1½ days, and half of the fetal cholesterol in about 2½ days. The quantity of glycogen synthesized and deposited in the fetus per day was found to be approximately equal to the total amount of glycogen present at this stage of development; i.e., some 500 mg. per 100 g. of tissue. The synthetic rates in the fetus are all appreciably higher than the corresponding rates in adult rats.

ATHEROSCLEROSIS AND ALIMENTARY HYPERLIPEMIA. J. R. Moreton (Joseph Edgar Tyree Memorial Lab., Salt Lake City, Utah). *Science 106,* 190-1 (1947). Circumstantial evidence on the occurrence of atherosclerosis supports this chylomicron theory of etiology. Atherosclerosis is rare in peoples who eat very low or nearly fat-free diets., i.e., Chinese and Okinawans; atherosclerotic disease decreased notably in Germany during the fat-shortage years immediately following World War I, atherosclerosis is more common in obese, overnourished persons than in the lean and undernourished; it is often less severe and less common in chronic alcoholics (who eat less, especially less fat, for which they often have intolerance) than in nonalcoholics; intimal lipid deposition and atherosclerosis are rare and minimal in wild animals (including the herbivorous anthropoid apes), which seldom, if ever, eat a meal containing the amount of fat found in the average human diet.

A NEW PHOSPHOLIPIDE-SPLITTING ENZYME SPECIFIC FOR THE ESTER LINKAGE BETWEEN THE NITROGENOUS BASE AND THE PHOSPHORIC ACID GROUPING. D. J. Hanahan and I. L. Chaikoff (Univ. California Med. School, Berkeley). *J. Biol. Chem. 169,* 699-705 (1947). A phospholipide-splitting enzyme specific for the ester linkage between the nitrogenous base and the phosphoric acid grouping is shown to be present in the carrot. Maximum activity for this enzyme was observed between pH 5.2 and 5.9 in a 0.05 M phosphate buffer. It showed a high degree of thermostability. It was not completely inactivated when exposed to a temperature of 95° for 15 minutes.

Reactions of carbinols in the presence of alkali. Part I. The reduction of ketones by primary alcohols. G. H. Hargreaves and L. N. Owen. (Imperial Coll. Sci. and Technol., London). *J. Chem. Soc. 1947,* 750-2. The reduction is described of several aliphatic ketones to the corresponding secondary alcohols by the action of simple aliphatic primary alcohols in the presence of concentrated aqueous alkali at 240°. The mechanism of the reaction is discussed. Part II. The scission of ricinoleic acid. *Ibid.* 753-6. It has been confirmed that the alkaline scission of ricinoleic acid does not occur below 180°. The initial products are probably Me *N*-hexyl ketone and 10-hydroxydecanoic acid; at higher temperatures (ca. 240°) these interact to give Me-*n*-hexylcarbinol, sebacic acid, and hydrogen, only one mechanism thus being necessary to explain both the "ketone-producing" and the "carbinol-producing" scissions. Sebacic semialdehyde has been obtained in pure crystalline form; it undergoes dehydrogenation to sebacic acid on treatment with alkali at 240°. Part III. The scission of a β-ethylenic carbinols. *Ibid.* 756-8. Oct-2-en-4-ol and 6-*ethyldec*-6-*en*-5-ol have been found to undergo both the "ketone-producing" and "carbinol-producing" types of fission, shown by ricinoleic acid, on treatment with alkali at 180-240°.

Preparation of nitriles and amines of ethylenic fat acids. G. Reutenauer and C. Paquot (Lab. Chevreul, I.T.E.R.G.). *Inds. corps gras 3,* 174-6 (1947). In continuation of R. & P., oleo- and eruco-nitriles were prepared, using temperatures of 280, 320, and 345°. The best results were obtained at 280° although the reaction was slower than at the higher temperatures. The characteristics of oleo- and eruco- products, respectively were % N 5.35 (theoretical 5.33), 4.31 (4.38); I no. 95 (96.5), 77.5 (79.5); b.p. 336° (at 760 mm. pressure) and 204° (at 12 mm.), 238-240° (at 13 mm.); d 0.848 (at $\frac{17°}{17°}$), 0.849 (at $\frac{12°}{12°}$); n_D^{20} 1.4566, 1.4603. The nitriles can be hydrogenated in alcohol saturated with NH_3 and in the presence of Raney Ni catalyst. The NH_3 could be replaced by a solution of Na_2CO_3. Thus hydrogenation is completed in 3 hours in a solution containing 20 g. nitrile, 30 cc. EtOH, 30 cc. H_2O, 20 g. Na_2CO_3, and 2 g. Ni catalyst. The b.p. of oleo- and erucoamines was 199° (at 11 mm.) and 231° (at 12 mm.), respectively.

PATENTS

Method of making nitrogenated cephalin. E. Trueger and B. Sheldon (American Lecithin Co.). *U. S. 2,422,321.* The process comprises the steps of reacting a cephalin-containing vegetable phosphatide with 2-nitrobutanol-1 at 130-170° and recovering the acetone soluble reaction product.

Stabilization of fatty materials. L. O. Buxton and C. E. Dryden (Nopco Chem. Co.). *U. S. 2,426,486.* A process for stabilizing a fatty material comprises contacting the fatty material with a vegetable meal in the presence of a relatively small amount of NH_3.

Process for producing dry food products. (Nopco Chem. Co.). *U. S. 2,427,520.* A process for producing a dry free-flowing vegetable material fortified with a fat-soluble vitamin comprises mixing a comminuted vegetable material with an emulsion of fat-soluble vitamin-containing material in molasses, and drying the resulting mixture by mixing therewith a quantity of CaO sufficient to substantially completely dehydrate the entire mass and amounting to at least 1/6 of the weight of molasses.

Stabilizing marine oils. L. O. Buxton and C. E. Dryden (Nopco Chem. Co.). *U. S. 2,426,485, Brit. 589,688.* A process for increasing the stability of a rendered fat-soluble vitamin-containing marine oil containing natural antioxidants normally associated therewith comprises heating an organic solvent solution of such an oil in contact with concentrated NH_4OH and subsequently freeing the oil of NH_3, water, and solvent by heating the mass under reduced pressure.

Vitamin product. M. Chanin (Scientific Nutrition Corp). *U. S. 2,426,762.* A vitamin product containing vitamins A and C, comprising particles of a hydrogenated vegetable oil having a melting point of approximately 140° F. and containing the vitamin C, the particles being distributed throughout a hydrogenated vegetable oil having a melting point of approximately 115° F. and containing the vitamin A in solution.

Ice cream. B. Nelson (Lanco Products Corp.). *U. S. 2,423,613.* The method of making an improved ice cream comprises incorporating a mixed glycerol diester of a higher fatty acid and an aromatic carboxylic acid in the unfrozen ice cream mix and thereafter subjecting the mix to freezing conditions.

Demulsifier. M. De Groot (Petrolite Corp., Ltd.). *U. S. 2,426,489-90.* The new chemical products herein described consist of an oxidized dimer of 9,11-linolo-di-ricinolein.

Rust preventive for lub oil. C. M. Blair (Petrolite Corp., Ltd.). *U. S. 2,426,338.* The composition is prepared by first making a diene synthesis product from drying oils and maleic anhydride and refluxing this with dodecylamine in benzol solution.

Artificial waxes. H. Burrell, P. I. Bowman, and R. H. Barth (Hayden Chem. Corp.). *U. S. 2,427,255.* An artificial wax consists of the reaction product of stearic acid, maleic anhydride and dipentaerythritol, in which the dipentaerythritol is substantially completely esterified by the acids in the proportion of approximately 0.75 equivalent of stearic acid and approximately 0.25 equivalent of maleic anhydride for each equivalent of dipentaerythritol.

Drying Oils

Edited by
HOWARD M. TEETER

Grapeseed oil driers as catalysts for drying oils. D. Pagani. *Ann. chim. applicata 37,* 3-11 (1947). Metal grapeseed oil soaps are classified according to their drying power in grapeseed oil. In the order of decreasing activity they are classified as follows: Fe^{+3}, Fe^{+2}, Cu, Zn, Ni, UO_2, Tl, Th, Ca, Na, and Mg. (*Chem. Abs. 41,* 5732.)

MODERN VIEWS ON DRYING OIL CHEMISTRY. C. P. A. Kappelmeier (Sikken's Varnish Works, Sassenheim, Holland). *Paint, Oil Chem. Rev. 110,* No. 15, 5-6, 30-1 (1947). Fifteen references. (*Chem. Abs. 41,* 6067.)

DRYING OILS. H. Wittcoff. *Progress Through Research* (Gen'l Mills, Inc.) *1,* 4 (1947). The mechanisms of drying oil oxidation, polymerization, reconstitution, conjugation, and modification are reviewed in the light of recent discoveries. The technology of paint, varnish, and enamel is also discussed briefly.

PATENTS

COATING COMPOSITION COMPRISING A VEHICLE CONTAINING DRYING OIL — MODIFIED ALKYD OR PHENOL-FORMALDEHYDE RESIN, PIGMENT, LITHARGE, AND CALCIUM HYDRATE. L. Balassa (E. I. du Pont de Nemours & Company). *U. S. 2,424,730.* A coating composition comprising a vehicle containing a resin is selected from the group consisting of alkyd and phenol formaldehyde resins modified with a drying fatty oil, a pigment and from 0.1% to 4.0% of litharge and calcium hydrate based on the total film-forming solids, dries in a 0.0005 inch film to a tack-free stage in less than about 10 minutes. The ratio of litharge to calcium hydrate in the composition is between 4 to 1 and 1 to 4 and the pigment is dispersed in the vehicle in the presence of the litharge and calcium hydrate.

METHOD OF MAKING VARNISHES FROM POLYHYDRIC ALCOHOL MIXED ESTER OF β-FURYLACRYLIC ACID AND ACIDIC NATURAL RESIN. H. S. Rothrock (E. I. du Pont de Nemours & Company). *U. S. 2,425,756.* A polyhydric alcohol is esterified with an esterifiable β-furylacrylic acid compound, of the class which consists of the acid, the acid chloride, the acid anhydride, and esters with monohydric alcohols which are free of additional groups that are reactive with esterifiable groups contained in the reaction mixture. A varnish is prepared by further esterifying the polyhydric alcohol reaction product with an acidic natural resin, heating the mixed ester with a natural fatty oil, and adding a varnish solvent.

REDUCING THE ACID NUMBER OF TALL OIL. Järvelän Tehtaat O/Y. *Norw. 71,841.* The acid number of tall oil is reduced by esterification with the fusel oils obtained from sulfite liquors. Esterification takes place by refluxing with or without the addition of sulfuric acid or alumina. The product is used for making paints or varnishes. (*Chem. Abs. 41,* 6048.)

Soaps

Edited by
LENORE PETCHAFT

PREPARING SOAP SAMPLES WITH THE LABORATORY PRESS. Samuel Klein, (Synfleur Scientific Laboratories, Monticello, N. Y.). *Soap 23,* No. 9, 33-4 (1947). A simple, time-saving method of preparing uniform experimental soap admixtures in sample cake form is described. The soap used is put through a household mincing machine, and the ground soap strained. The soap is transferred to a porcelain evaporating dish and the material to be added (powder or liquid) is added and mixed uniformly in the dish. The mixture is then placed in the Carver test cylinder, tamped down and compressed. A uniform sample is thereby obtained — a simple method of evaluating colors, antioxidants, and aromatics.

PRODUCTION OF SOAP FROM WASTES OF DAIRY INDUSTRY. K. Promtov. *Myasnaya i Molochnaya Prom. S.S.S.R. 1946,* No. 4, 59-60. The amounts of fats utilized from various dairy products, as milk, margarine, or cheese, are established. Fat-containing waste products are salvaged and made into soap. The process involves boiling with NaOH (140-150 g. NaOH per kg. fat) for 2.5-3.5 hours and treatment with salt solution or dry salt. In waste products where the percentage of fat is low, they are treated with absorbing clay (4-8%) or bone-char to recover the maximum of fat. (*Chem. Abs. 41,* 5736.)

PRECIPITATING EFFECT OF CATIONIC DETERGENTS ON SOLUBLE STARCH. M. Mutahhar Yenson (Univ. Istanbul). *Nature 159,* 813 (1947). "Desogen" (methylphenyldodecyltrimethylammonium methosulfate) precipitates, soluble starch, producing minute turbidity at pH 14 and pH 7. Maximum precipitates were produced with mixtures containing 20 mg. "Desogen" and 80 mg. soluble starch in 10 ml. of buffer solution. The precipitates dissolve on warming, and reappear on cooling. "Desogen" inhibits the formation of a blue color on reaction of soluble starch with I. (*Chem. Abs. 41,* 5774.)

THE SORPTION OF ORGANIC VAPORS BY MONOLAYERS OF SOAP. R. B. Dean and James W. McBain. *J. Colloid Sci. 2,* 383-85 (1947). A new method for studying molecular interactions at surfaces is to expose an insoluble monolayer on water to the vapor of a volatile liquid. Some vapors produce no change in area. Others increase the area of the monolayer, those with high spreading pressure being usually most effective, some even doing so under a higher pressure than their own spreading pressure.

THE EFFECTS OF TEMPERATURE UPON THE CRITICAL CONCENTRATIONS OF ANIONIC AND CATIONIC DETERGENTS. H. B. Klevens (University of Chicago, Chicago, Ill.). *J. Phys. Colloid Chem. 51,* 1143-53 (1947). Increase in temperature causes an apparent decrease in the critical micelle concentrations (c.m.c.) of soaps and detergents, as determined by spectral changes in various dyes. This apparent decrease in the c.m.c. seems not to be a function of micelle formation but rather due to changes in dye aggregation. Reported values of the c.m.c. as determined by the dye method are at all times found to be smaller than those determined by either conductivity or refraction. The application of a titration technique in place of spectroscopic measurements permits rapid determinations of the c.m.c.

STUDY OF ALUMINUM SOAP-HYDROCARBON SYSTEMS: "CALOTROPY" AND TRUE STABILITY OF THE JELLY PHASE. Karol J. Mysels (Stanford University, California). *J. Colloid Sci. 2,* 375-82 (1947). Viscometric measurements showing the gradual transition from jelly to sol without phase change in aluminum dilaurate-cyclohexane systems are reported. Jellies, the clear, elastic homogeneous colloidal systems which have high viscosities and may be even rigid, are sometimes unstable, being syneretic, or liquefying spontaneously to a thin sol, or precipitating out to form an inhomogeneous gel. The germ gel is used to connote a two-phase system in which there is X-ray or other evidence of the presence of the crystalline solid, more or less disintegrated and enmeshing the second phase, that may be solvent, sol or jelly. Observations of "calotropic" recovery, the slow increase of viscosity after cooling from a higher temperature, are reported for these systems under conditions in which the jelly, a single phase, is stable with respect to gel,, a two-phase system involving crystalline solid. The existence of a large region in which a jelly phase is thermodynamically stable is thus demonstrated.

PROPERTIES OF SAPONINS. SURFACE ACTIVITY AND DEGREE OF DISPERSION. R. Ruyssen and R. Loos. *J. Colloid Sci. 2,* 429-51 (1947). The name saponin is given to substances whose properties have a certain analogy with those of soaps. The saponins in water solution are adsorbed similarly at the water-air and at the water-benzene boundary. The surface and interfacial tension lowering by the acid saponins is strongly influenced by the hydrogen ion concentration, the tension values being much lower in acid than in alkaline medium. We find it reasonable to ascribe this effect to a decrease in electrolytic dissociation. In the case of sapoalbin the influence of electrolytes was studied; sodium salts considerably lowered the surface tension (in alkaline medium). The molecular area obtained from the spreading measurements was compared with that derived from Gibbs' adsorption equation. Some data were in good agreement but, on the other hand, very large discrepancies were found, showing that, in this case, Gibbs' equation is not applicable in its simple form (probably because the system may not be considered as a two-component system). From our measurements we were able to conclude that the saponins studied appear as large molecules, 10-12 A in diameter and with molecular weights ranging up to 1644. When dissolved in water, they are dispersed into single molecules and ions, and even in concentrated solutions there is probably no association into neutral or ionic micelles.

SYNTHETIC CHEMICALS IN THE TEXTILE INDUSTRY. Paul I. Smith. *Soap 23,* No. 9, 40-1 (1947). The uses of detergents, wetting agents and emulsifiers in textile processes are described. Detergents should dissolve in warm or hot water to give a neutral solution, the solution should be stable in the presence of salts and alkalies, and the detergents should possess good wetting, emulsifying, levelling, and penetrating properties. Wetting agents should wet material very quickly irrespective of weave or thickness, should be readily soluble in water at all temperatures and give clear solutions; they must be neutral in reaction and exercise powerful wetting power at low dilutions. Emulsifiers should be odorless, colorless, dissolve readily, be gentle to fibers, and emulsions from them should be easy to prepare and stable. Specific applications based on these various properties and qualifications are outlined.

THE PHASE BEHAVIOR OF SODIUM STEARATE IN ANHYDROUS ORGANIC SOLVENTS. Gerould H. Smith and James W. McBain (Stanford University, California). *J. Phys. Colloid Chem. 51,* 1189-1204 (1947). The phase behavior of anhydrous systems of sodium stearate and hydrocarbons was studied in sealed tubes by visual observation, employing n-heptane, isooctane, cyclohexane, benzene, toluene, ethylbenzene *o*-xylene, *m*-xylene, *p*-xylene, cumene, n-butylbenzene, and *p*-cymene. These systems are believed to be drier than any hitherto studied. The soap was soluble to the same extent in all of the pure hydrocarbons. The samples of p-cymene and n-butylbenzene differed, but contained impurities. The phase diagrams are very similar in form for all the hydrocarbons here studied, but differ greatly from that reported elsewhere for cetane. Five general conditions were found to exist in the anhydrous hydrocarbon systems, as follows: (a) A white, opaque gel (two-phase) that exhibits limited swelling as a direct function of temperature; the gel involves more or less dispersed solid crystalline phase, together with sol or jelly (see below). (b) A golden or orange, translucent, liquid-crystalline phase. (c) A white, wax-like, semitranslucent, liquid-crystalline phase, which melts to isotropic liquid at a considerably higher temperature than the pure sodium stearate. (d) An isotropic solution, continuous in phase with the jelly (e). (e) In special regions of the sol, not sharply delimited, an isotropic jelly which has unlimited swelling, passing to the solution without any observed transition or change of phase. All phase changes were reversible and obey the phase rule of Willard Gibbs.