the eight laboratories in the spot test with alkali. In the case of 4 out of the 6 papers tested, viz.: M-350, M-284B, K-30 and K-30W35, the agreement among laboratories is rather striking.

(2) Poor correlation between

(a) Alkali spot test and soap contact tests in some cases. Paper K-30W35 showed relatively poor resistance to the alkali spot test, yet showed very little discoloration in the soap contact tests even with filled laundry soap.

(b) Extraction test and either alkali spot test or soap contact test. Paper M-350 shows by far the highest color in the extraction test yet is much superior to M-284B in the soap contact test.

Conclusion:

The compiled results clearly indicate that considerably more comparative tests on more samples of paper should be carried out before this committee is in a position to recommend even a tentative method of evaluating paper for use as a soap wrapper.

L. F. Hoyt, Chairman.

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ABSTRACTS

Oils and Fats

Edited by
W. F. BOLLENS and M. M. PISKUR

The origin of fathardening. W. Normann. *Chem-Ztg.* **61,** 20-22 (1937). The early history is given.

Notes on the hydrogenation of tea-seed oil. Hung-Yuan Chan and Shün-Hsü Wang. *J. Chem. Eng. China* **1,** 136-7 (1934). Tea-seed oil, purified and treated with Cu hydrate, is readily hydrogenated in the presence of a Ni catalyst contg. Ni 75 and Cu 25%. The catalyst is prepd. by pptg. a mixt. of the nitrates of these 2 metals on fuller's earth by means of Na_2CO_3 and heating the dried carbonate mixt. in H_2 at 350-360° for 1 hr. Five % by wt. of the catalyst is used for the hydrogenation, for which the best temp. is 180-190°. The solid product thus obtained is a hard mass with a solidification point of about 44.5°; it possesses excellent odor. (*Chem. Abs.*)

Studies on the chemistry of the fat acids. II. The preparation of pure oleic acid by a simplified method. J. B. Brown and C. Y. Shinowara. *J. Am. Chem. Soc.* **59,** 6-7 (1936). The method pertains to fractional crystalization of olive oil fat acids from acetone soln. followed by vacuum distn.

The condensation of maleic anhydride with tung oil: A new "constant" for oils. B. A. Ellis and R. A. Jones. *Analyst* **61,** 812-6 (1936). A new procedure for detg. the "diene value" of fats was developed. It is proposed that "maleic acid value" (M.A.V.) be used as it indicates the method used and because it makes no assumption as to the mechanism of the reaction. Procedure: 3 g. sample of oil is placed in 250 cc. flask with ground glass neck. Add 25 cc. 6% maleic anhydride in toluene and a pinch of fine pumice to prevent bumping. The flask is connected to a reflux condenser through means of ground glass joint lubricated with fine graphite powder. Boil for 3 hrs. Wash down condenser with 5 cc. ether and 20 cc. H_2O. Pour into separatory funnel and wash flask with 20 cc. ether and 25 cc. H_2O. The funnel is shaken, allowed to stand and the water layer separated. The residual liquid is further extd. with H_2O. The aqueous mixt. is titrated with 1-*n* NaOH.

$$\text{"M.A.V." in term of I} = \frac{12.892 \text{ x cc. N Na OH used}}{\text{Wt. of sample in g.}}$$

"M.A.V." of several oils was detd. Experimental error is probably ± 0.3.

Rancidity as a problem in oils and fats. E. E. Russell. *Can. Chem. Met.* **20,** 346-8 (1936). Rancidity is caused by the presence in the fat of the aldehydes corresponding to enanthylic, pelargonic, butyric, caprylic and capric acids. It is upon these oxidizable aldehydes that the chem. tests for rancidity depend. The stages of decompn. are indicated and the effects of color, of enzymes and of light rays in producing randicity discussed. The Kreis and other colorimetric tests are outlined. The O taken up by the oil or fat attacks the double bonds of the unsatd. acids as the glycerol acids. The glycerides are probably attacked as well as the fatty acid mols. Early quant. methods for detection of peroxides or active O in oils are outlined and a method is described that eliminates personal factors. (*Chem. Abs.*)

Irradiation of fats. II. Some observations on methods of analysis of oxidized fats and on the interrelation of the results obtained. L. H. Lampitt and N. D. Sylvester. *Biochem. J.* **30,** 2237-2249 (1936). Summary: Modifications of methods for Kreis test, detn. of Issoglio value and detn. of peroxides according to Lea are presented. Figures are given for detns.

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Kreis test intensities, peroxide values and aldehyde values on irradiated fats both before and after the Issoglio detn. The latter has been found to cause a reduction of about 16% in the peroxide value, about 55% in the Kreis test intensity and about 55% in the aldehyde value. These figures were not dependent on the degree of oxidation of the fats. The Issoglio value appears to be proportional to the reduction in the aldehyde value and also to the aldehyde value of the original fat. The aldehyde value and the peroxide value have been found to be roughly proportional. Since the Issoglio value is proportional to the aldehyde value, it is also proportional to the peroxide value.

Determination of the melting points of fats and waxes. J. A. Scarrow. *Can. Chem. Met.* **20,** 305-306 (1936). A method is described in which a regulated pressure is used to move the sample as soon as it softens; this movement is taken as the end point rather than the gradually developing transparency as in conventional methods. A water bath is used to melt the tubed samples. A 50-cc. beaker of water, with a wire loop inserted for manual stirring, was employed in control work in a synthetic wax-blending process. The capillary tubes were about 4.45 cm. in length and 0.089-0.127 cm. in diam. with 0.013-0.020 cm. wall thickness. The tube is filled in the usual manner and is attached to the thermometer and inserted into the water so that the top surface of the fat column is exactly 1.27 cm. below the surface level of the water. A hydrostatic pressure, approx. equiv. to 1.27 cm. of water, acts on the lower surface of the fat. When it softens sufficiently to loosen, it rises to the surface level of the water in the beaker. The pressure on the sample and the rate of heating are the only precautions necessary. (*Chem. Abs.*)

Rapid method of saponification. W. R. Steet. *Analyst* **61,** 687 (1936). The EtOH in alc. KOH solns. can be replaced to advantage by $C_2H_4OH(OC_2H_5)$ which will raise the temp. of sapon. Even with compounded mineral oils complete sapon. is obtained in 15 min. and the results obtained with pure fatty oils are identical with those obtained with KOH in alc. (*Chem. Abs.*)

Metallic soaps for thickening mineral oils. C. J. Boner. *Ind. & Eng. Chem.* **29,** 58-60 (1936). Eighteen metals were combined with two fatty acids of different titer to form metallic soaps. These soaps were heated to the same temp. with 2 mineral oils and cooled to find whether grease resulted. Grease was formed with soaps from 9 of the metals. These 9, with the exception of Al, were divalent or gave divalent compounds. Soaps of the metals with the lowest atomic weights produced greases of best transparency. In general, soaps of the more basic metals produced the softest greases. Water as an emulsifier was not required except in the case of Ca and Sr soaps. The consistency was heaviest and the dropping point highest in greases made from the highest titer acids. Behavior of the metallic soaps in both naphthenic- and paraffin-base oils with a Saybolt viscosity of 100 at 100° F. was similar.

Soybean oil meal prepared at different temperatures as a feed for poultry. J. W. Hayward, J. G. Halpin, C. E. Holmes, G. Bohstedt and E. B. Hart. *Poultry Sci.* **16,** 3-14 (1936). The chicks fed a ration contg. 16 parts soybean oil meal and minerals, or a combination consisting of 12 parts soybean oil meal, 2 parts meat scraps, and 2 parts dried milk plus minerals, did not equal in average wt. at 8 weeks or in feed required per unit of gain the chicks fed a protein supplement consisting of 8 parts meat scraps and 8 parts of dried milk, regardless of the soybean oil meal that was used. The combination of 12 parts high temp. expeller soybean oil meal, 2 parts meat scraps, and 2 parts dried milk plus minerals surpassed 16 parts of soybean oil meal plus minerals and approximately equalled the combination of 8 parts soybean oil meal, 4 parts meat scraps, and 4 parts dried milk plus minerals or the all animal protein supplement consisting of 8 parts meat scraps and 8 parts dried milk in wt. of pullets and feed required per unit of gain at 20 weeks in two feeding trials.

Baltimore Production Club reports on study of heatbodied oils. Anon. *Am. Paint J.* **21,** Convention Daily 14-15, 16-17, 18 (Nov. 19, 1936).—A study was made of bodied linseed oils; they were heated in an elec. processing equipment. Phys. and chem. tests were detd. on all samples. The I value, viscosity, sp. gr. *n*-viscosity and acid no.-viscosity curves are shown for varnishes prepd. in different types of kettles and under different conditions. Conclusions: (1) high acid nos. are not inherent in CO_2 processing but are the result of condensation which can be prevented by proper design of processing equipment. (2) Livering tendencies are no greater with elec. kettle-CO_2 processed oils than with open kettle oils. (3) Elec. kettle oils processed as outlined show dispersion with Milori blue superior to open kettle oils. (4) Conclusions (2) and (3) indicate that elec. processing has effected improvements in structure of the oil (by uniform polymerization) which have more than compensated for the nonoxidation. (5) The dominant factor producing livering between bodied linseed oils and basic pigments is the acid no. of the oil, whereas the effect of oil viscosity is slight in comparison. (6) Moisture accelerates livering. (7) Neither acid no. nor viscosity of the oils is responsible for livering with Milori blue. (8) Excessively high acid nos. of non-break oils processed in open kettles are due to imprisonment of acids beneath the "head" formed during heating. (9) Bodying is related to acid no. and I no. (*Chem. Abs.*)

The deacidification of fats and oils with alkali and filtering the soap formed. F. Wittka. *Chem.-Ztg.* **61,** 56-57 (1937). The present day methods of deacidifying fats and oils and removing soap formed are reviewed and compared. Caustic refining of castor oil is recommended.

Hydrogenated castor oil as an ointment base. Geo. W. Fiero. *J. Am. Pharm. Assoc.* **25,** 862-3 (1936). The merits of hydrogenated castor oil for the prepn. of ointments are discussed. Very satisfactory products were obtained by substituting soft hydrogenated castor

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oil for petrolatum or wool fat and hard hydrogenated castor oil for wax, etc., in the prepn. of U. S. P. ointments, and a few of the products were quite superior to the official ointments. (*Chem. Abs.*)

Twitchell reagents. XVII. Properties of sulfo compounds isolated from commercial wetting agents. Kyosuke Nishizawa and Rynji Kinoshita. *J. Soc. Chem. Ind., Japan* **39,** Suppl. binding 293-4 (1936). The com. prepns. Nekal BX (**I**), Igepon T, Gardinol R and sulfo fatty acid (**II**) were examd. The influence of the addn. of concd. H_2SO_4 upon the fat-splitting and emulsifying power of 1% aq. solns. of the agents at 95° is shown. **I** split olive oil to a considerable extent, while **II** was only moderately effective but more than the others. The emulsifying power of **I** was great and increased with the addn. of H_2SO_4. That of **II,** and of the other was low and hardly increased with H_2SO_4 addns.

XVIII. Relation between the constitution of sulfonic acids and their properties. Kyosuke Nishizawa, Teizaburo Kawasaki and Satoru Hiraoka. *Ibid.* 360-1. Sulfonic acids of naphthalene, tetralin, anthraquinone, cetylbenzene, laurylbenzene (Ba salt), propylnaphthalene and butylnaphthalene were tested in regard to their fat-splitting power and exptl. results are given. The properties of cetylbenzenesulfonic acid, a powerful splitting agent, are reported. (*Chem. Abs.*)

New York Club studies properties of linseed oil—concluded. Anon. *Am. Paint J.* **21,** Convention Daily 24-5 (Nov. 18, 1936). The exptel. data is summarized as follows: With the exception of acidity and color, oil properties cannot be used to differentiate between air- and vacuum-bodied oils. Me_2CO-insol. substances are not developed up to a viscosity of nearly 3 poises but at this point about 10% Me_2CO-insol. substances are quickly formed. The consistency of TiO_2, iron oxide, Chinese blue or deep para toner pastes is not greatly influenced by any oil property other than viscosity and the pastes show little change with age. ZnO pastes show a very regular behavior with vacuum-bodied oils and little change with age but the acidity of air-bodied oils is reflected in the changes induced with this pigment even below the point of livering. The grinding time of C black decreases quite generally with increasing oil viscosity. Chinese blue pastes showed a marked decrease in grinding time with increasing oil viscosity up to about 69 poises. Toluidine toners exhibit greater differences as between the types of pigment than was shown by any difference in the oils. Pigment dispersion is improved with increasing acidity of the oil, up to acid No. 3. Practical flat wall paints can be made from oils of a wide range of viscosities with oils bodied in air or vacuum. Good gloss is obtained in the enamels with all oils having a viscosity above 2 poises except from a viscosity of 10.8 poises and higher with oil bodied in air at 316°. Oils of these types can be specified for definite purposes with a foreknowledge of the results to be expected. (*Chem. Abs.*)

PATENTS

Process for removing low molecular glycerides from polymerized oils by distillation. D. Oosterhof and H. I. Waterman (to Imp. Chem. Indus., Ltd.) U. S. 2,065,728. App. is described. It comprises means of flowing a polymerized oil over heated surface in close proximity to a cooled condensing surface concentric with the heated surface under a vacuum of the order of cathode tube vacuum, to yield as a residue the polymerized constituents of the starting material.

Antileak agent for greases. W. P. Hilliker (to Standard Oil Co.) U. S. 2,065,857. The invention comprises adding 5-20% Ca-soap and 1.4% of an aminophenol to mineral oil.

Hydrolysis of fats and greases. J. R. Moore and E. K. Wallace. U. S. 2,065,145. The fat is dissolved in a water-miscible solvent, such as acetone, Me-Et-ketone, diethyl ketone, ethylene glycol monethyl ether and dioxan; water and catalyst are added and mixt. is subjected to splitting temps. The solvent is distilled off and the glycerol water sol. is separated from the top layer of fat acids.

Process of making fat-containing powder. E. J. Fechner (to the Page Milk Co.). U. S. 2,065,675-6. Comminuted dry shortening is prepd. by heating milk and hydrogenated vegetable oil to about 145-175° F., homogenizing, spray-drying the homogenized mixture and quick removing the dried material from exposure to the warm air of the drier.

Process of liberating fatty acids in fatty material. E. W. Eckey and C. C. Clark (to Proctor & Gamble Co.) U. S. 2,065,520. Free fat acids in fats are increased by liberating the acid from soap mixed in the fat with a polybasic acid having antioxidant power.

Treatment of conditioning of cottonseed meats and pressing oil from same. T. J. Harrell and C. W. McMath (to Traders Oil Mill Co.) U. S. 2,064,158. The seeds are crushed, heated to 190° F., water content is then raised to 11%; and this is followed by treatment at 222-235° F. temps. to reduce water content to 5.5-7.5%.

Production of vegetable oils. P. Amman. Brit. 452,892. The oil bearing substances are desiccated to 3% water content without roasting and are then subjected to pressure extraction.

Oils. Chemische Fabrik Stockhausen & Cie. Ger. 631,910, July 4, 1936 (Cl. 12*o*. 23.02). Water-sol. oils in an unsapond. or only partly sapond. condition are obtained by treating high-melting fatty acids contg. fatty acid esters with a strong sulfonating agent in the presence of an indifferent solvent at temps. not exceeding 0°, the reaction products being neutralized as quickly as possible and the products washed out at raised temp. The smallest possible amt. of ice is added to prevent the cleavage of the fatty acid ester. Thus, peanut oil is dissolved in C_2HCl_3, cooled to —5°, treated with oleum and washed with ice water to give a clear oil. Other examples are given. The oils are *used in the metal industry.* (*Chem. Abs.*)

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Deacidifying oils and fats. Gregory Leot. Brit. 451,730, Aug. 11, 1936. In allowing alkali- or alk. earth-coated heavy particles to settle through a body of oil or melted fat for deacidification thereof, the particles are sprinkled uniformly on the surface, e. g., by gauze or a sieve. The process may be repeated and the liquid may be kept in motion, e. g., by passage therethrough of an inert gas, e. g., N. CO_2, H. (*Chem. Abs.*)

Expelling liquid from cashew nut shells by heat. Edward R. Hughes (to Harvel Corp.). U. S. 2,058,456, Oct. 27. After causing the nut to absorb moisture, heat is applied to it by means of a body of cashew nut shell liquid in contact with the outside of the nuts, the temp. and the time of immersion being such as to effect discharge of a major portion of the shell liquid without scorching the nut-shell kernels. (*Chem. Abs.*)

Polymerizing drying-oils and fatty acids. Eric Wm. Fawcett, Reginald O. Gibson, Michael W. Perrin and Imperial Chemical Industries, Ltd. Brit. 452,039, Aug. 17, 1936. Polymerization is effected by heating under more than 500 atm. pressure. The oils and acids may be first degassed to remove H_2O and dissolved O; the products may be freed from decompd. matter and from unpolymerized oil or fat by short-path high-vacuum distn.; the polymerized fatty acids may be esterified to produce polymerized oils. Among examples, alkali-refined linseed oil is maintained at 325° for 1.5 hrs. under 3000 atm. pressure, and fatty acids, obtained by sapong. crude linseed oil with NaOH and acidifying with H_2SO_4, are kept at 280° for 3-4 hrs. under 3000 atm. (*Chem. Abs.*)

ABSTRACTS

Soaps

Edited by M. L. SHEELY

Tin Soaps as Anti-Oxidants. *The Industrial Chemist* **12,** 142, 492 (1936). The autoxidation of textile oleins and oils has sometimes caused considerable losses by spoiling materials treated with them and even by starting fires. Hitherto, organic reducing compounds have been employed to inhibit the autoxidation process, but various objectionable properties of these substances tend to reduce their usefulness. The International Tin Research and Department Council in Technical Publication No. 45 describes the work of Dr. S. H. Bertram which, it is claimed, shows that oil-soluble salts of tin, in the stannous condition, are good anti-oxidation catalysts free from these disadvantages. Additions of the order of 0.1 per cent of stannous oleate, stearate, or benxoate to textile oils delay the onset of oxidation and retard oxidation once it has started.

The mechanism of the retarding effect of stannous salts has been investigated, and it has been found that a direct relationship exists between the oxidizability of the textile-spinning lubricants and their content of peroxides. The oxidation products are probably the real catalyzers of the oxidation of the oleins or oils. The antioxidation effects of the stannous salts is due to their ability to reduce these highly catalytic oxidation products.

A Color Reaction of Glycerol. V. Arreguine. *Act. Trab. V. Congr. Nac. Med.* **7,** 396 (1934); *Anales asoc. quim. Argentina* **24,** 6B (1936). If, to a solution of dihydroxyacetone, obtained by oxidation of glycerol by Br by the Deniges method, there be added concentrated H_2SO_4, then superimposed thereon a 1% alcohol solution of veratrole, there forms instantaneously an intense indigo-blue ring at the zone of separation, which diffuses into the alcohol zone. The sensitiveness is 1/500. It appears to be specific for glycerol, not being obtained with other polyhydric alcohols or sugars. (*Chem. Abs.*)

Glycerine Dehydrating Manufactured Gas. *British, The Chemical Trade Journal,* 364 (October 30, 1936). Glycerine is serving successfully for the partial dehydration of manufactured gas in several British plants. Only routine attention required, in addition to the daily reconcentration of the weak glycerine, is occasional cleaning of the jet condenser in the vacuum evaporator. Amount of glycerine required to replace losses is less than first reported. (*Chemical Industries* **39,** 606 (1936).)

Effect of salts on detergent action of soap. F. H. Rhodes and C. S. Wynn. *Ind. & Eng. Chem.* **29,** 55-57 (1937). In washing tests made with artificially soiled cloth at 60° C., the detergent action of a 0.25% soap soln. is at a maximum when the alkalinity of the soln. is adjusted to a pH of about 9.66. The addn. of sodium chloride, sulphate, or phosphate to soap solns. at the optimum pH at first increases and then decreases the detergent effect. The effectiveness of the added salt at the optimum concn. is approx. proportional to the valence of the anion of the added salt. Sodium borate and acetate do not enhance the detergent action of the soap.

Improving Soap Packs. *Soap, Perfumery and Cosmetics* **1936,** 215. Soap tablets designed to fit the hand are usually concave-convex (or curved) in shape and are occasionally ribbed along the edges. Though these easy-to-hold tablets present considerable technical difficulties, when it comes to high-speed mechanical