ABSTRACTS

Oils and Fats

Edited by
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4 parts per million of NO_2, which is formed from air by the action of flames, sparks or ultraviolet light. O_3 is without action. The yellowing of paints and paper, the fading of ink, and the knocking of motor fuels may also be influenced by traces of NO_2. App. is described for studying the "crystallization," which is a very sensitive test for NO_2. (*C. A.* **30,** 2410.)

The yellowing of oil films and its prevention. III. A. Eibner. *Paint Varnish Production Mgr.* **14,** 7-8, 10-11 (Feb., 1936); cf. *C. A.* **29,** 8364^9. A discussion of **Hantz'** hypothesis of pseudo acids, as applied to the yellowing oil, and of other hypotheses. The glycerol radical tends to prevent the yellowing of oil films exposed to light. Et ester and glycol esters yellowed in 30 days or less, while the glyceride showed no yellowing after 45 days' exposure to light. A decrease of the O content of the films decreases the yellowing tendency. (*C. A.* **30,** 2410.)

Report of experiments on the manufacture of lubricating oil from vegetable oils. E. C. Ku and Su-Ming Chen. *Ind. Research* (*China*) **4,** 239-44 (1935). After partial oxidation by blowing in air, soybean oil becomes viscous and assumes the properties of lubricating oils. Expts. are reported for different temps. (150°, 175°, 200°, 225°) and different times of air blowing (2, 4, 6, 8 hrs.). The best result is obtained at 200° for 8 hrs., the product having then a viscosity of 866° Saybolt. The product is yellowish brown and has an acid value of 0.26. (*C. A.* **30,** 2742.)

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Apparatus for rendering fat. Charles B. Upton. Can. 355,866, Feb. 11, 1936. A charge of fat-bearing materials is heated and continuously agitated in one portion of a closed chamber to release the fats, which are drained to another portion of the chamber and continuously agitated and heated and mixed with a finely divided solid refining agent. Both portions of the chamber are subjected to a partial vacuum, and the refined fats sepd. from the refining agent, so that the refined fats, the cracklings and the refining agent can be removed separately from the chamber. (*C. A.* **30,** 2787.)

Highly viscous products from catalytic polymerization of fatty oils. N. V. de Bataafsche Petroleum Maatschappij (E. Eichwald, inventor). Dutch 36,242, Sept. 16, 1935. Fatty oils (e.g., rape oil) are polymerized at temps. below 200° in the presence of BF_3 catalysts (1%) with or without diluent. The product is valuable in lubricating oils because of its flat viscosity curve. (*C. A.* **30,** 2788.)

Nondrying denatured fish oils. Asahi Denka Kôgyô K. K. (Naoki Kumagai, inventor). Japan 111,342, June 26, 1935. A fish oil is hydrogenated until its I value becomes 100-40. Then it is heated with BuOH (or AmOH, cyclohexanol or methylcyclohexanol). The product is a liquid at room temp. and its m. p. and viscosity are low; it is suitable for use in the textile industry, soap manuf., etc. (*C. A.* **30,** 2416.)

Polymerization products from drying or semidrying oils. N. V. Industrielle Maatschappij voorheen Noury & van der Lande. Dutch 36,952, Dec. 16, 1935. The product of polymerization of fat acids or of saponified polymerized fatty acids is sepd. from nonpolymerized acid by steam or vacuum distn.; satd. acids and oleic acid will distil. The polymerized acids in the distn. residue are esterified to glycerides. The polymerization itself is conducted under high or low pressure at about 300°. (*C. A.* **30,** 2788.)

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Soaps

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Disinfectant Soaps. *Perfumery and Essential Oil Record* **27,** [4] 187 (1935). In a paper on "Industrial Disinfectants" recently published in "Chemistry and Industry" (February 7, 1936, 107, the author, J. Gibson, has a good deal to say of interest to the maker of disinfectant soaps. At the outset he states that mercuric chloride is much weaker as a germicide than was formerly supposed, its carbolic coefficient being only 23; he adds that the efficiency of mercury salts is rapidly destroyed by organic matter and that they are precipitated by soap. He did not mention, however, that the incompatibility of mercuric iodide or bromide with soap was overcome many years ago by Thompson and by Cooke, by the addition respectively of the corresponding potassium salts, i.e., potassium iodide or bromide, nor did he make any reference to the new organic mercury compounds the addition of which to soap was recently patented by Lever Bros. ("P. & E. C. R.," 1935, 400). A large amount of research was carried out last year in America on the bactericidal action of organmercury compounds, notably by Hart and Anderson ("J. Amer. Chem. Soc.," 1935, 1059) and by Stark and Montgomery ("J. Bact.," 1935, 6), and their high germicidal activity has been fully established and as has already been pointed out, it is claimed in the patent referred to above, that the addition of 0.1 per cent of these substances is sufficient to produce a good germicidal soap.

Gibson's paper deals fairly fully with the coal tar disinfectants, including lysol, the so-called "black fluids" which consist of creosote oil and phenols emulsified with soap, and the "white fluids" consisting of the same coal tar raw materials, but emulsified with glue, gelatine, casein, or dextrin. Lysol and similar fluids are said to

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be the only disinfectants made from the B. P. cresol, which consists chiefly of the three isomeric cresols. These are more toxic and less germicidal than the commercial cresylic acid, which has a somewhat higher distillation range, and the higher boiling acids (30 per cent below 230° C., 90 per cent below 290° C.) are still less toxic and have a much higher carbolic coefficient. Thus lysol has a coefficient of only 1.75 to 2, a disinfectant containing 20 per cent cresylic acid may have a coefficient of 10, and one containing 20 per cent of high boiling acids may have a coefficient as high as 20. An important point established is that "black fluids," in which soap used as the emulsifier, are much better disinfectants than "white fluids" in which some other emulsifier is employed.

Are Soap Spots Caused by the Perfume? R. Fornet. *Seifensieder-Ztg.* **62,** 1024-5 (1935). Well-defined spots in soap are usually due not to the perfume used but to rust particles. Low-grade perfumes, however, may cause serious discoloration, especially in white soap. (*C. A.* **30,** 2415.)

Odorless Solvent Soaps. *Seifensieder-Ztg.* **63,** 234-5 (1936). Fat solvents usually possess a characteristic odor. Therefore the greater the amount of such a product there is added to soap, the more noticeable this odor will be. Increasing the amount of emulsifier (as well as the amount of the solvent), decreases the foaming power of the soap. Each advantage has a corresponding disadvantage, so that it is necessary to choose a middle course. Triethanolamine oleate serves as an odorless reagent, which is soluble in most organic solvents, and which can be added to solid or liquid soap. Dissolve 1 part of triethanolamine oleate in 2 parts of benzine, acetone, or xylol, etc., and add this solution to 2 to 3 parts of cold-process soap or to 2 to 4 parts of a potassium soap solution. (*Soap* **XII,** [5] 69 [1936].)

Distilled Palm Oil Fatty Acids. *Oil and Colour Trades J.* **89,** 1952, 868 (1936). The distillation of fatty acids and their use in various ways, including soap manufacture, has made considerable progress in recent years, forming the subject-matter of numerous patents, of which quite a few survive as important technically successful and commercially profitable processes, such as those of Keutgen, Bergell, Stiepel, Volkman, Hanig, Feld and Vorstmann, etc. In regard to palm oil fatty acids, a recent anonymous writer ("Seifens. Zeit.," 1935, 62, 1023-4) strongly recommends these in preference to bleached palm oil for soap-making, especially in toilet soaps, wherein they could also to a large extent replace hardened fats. But the use of distilled fatty acids, in Germany at all events, is not only advantageous but is likely very soon to be compulsory for toilet soaps, as is already the case for household soaps. In using these acids for soap manufacture, an important part of the process is thorough stirring.

The question is discussed as to whether or not neutral oil or fatty acids should be hardened, the latter being considered as the more difficult. Reference is made to some recent patents for hardening fatty acids, such as that of Henkel's English Patent 358,328. The author finally expresses the view that the use of distilled fatty acids must inevitably increase in Germany, in view of stringent Government regulations, if the same quality soaps, particularly in respect of color, are to be produced as were previously manufactured when tallow and bleached vegetable oils were plentiful and cheap.

Composition of Fatty Acid Films on Water Containing Calcium or Barium Salts. Irving Langmuir and Vincent J. Schaefer. *J. Am. Chem. Soc.* **58,** 284-7 (1936). A technic for skimming off unimolecular films of fatty acids from H_2O and analyzing them is described. The organic matter is destroyed with H_2SO_4 and the metal is weighed as sulfate. With 10^{-4} M Ca or Ba salts, stearic acid forms films of almost pure neutral soaps when the pH is 11 and films of free fatty acid when pH is 3. Half-conversion to neutral soap occurs at pH 5.1 for Ca and pH 6.6 for Ba. These metallic constituents of the film have a profound effect on the physical properties of the films, increasing the rigidity and affecting the ease with which multimolecular films can be formed on metals or glass. cf. C. A. 29, 5328. (*C. A.* **30,** 2454.)

Fatty Acid Distillation. *Oil and Colour Trades J.* **89,** 1958, 1331 (1936). Dr. C. H. Keutgen ("Seifens. Zeit.," 63, 1936, 155-6, 187-8, 208-9) reviews modern methods of fatty acid distillation, with particular reference to a comparison of continuous and non-continuous (or batch) distillation. Several advantages are claimed for the latter, which can also be made approximating to a continuous method by connecting up two or more stills in a suitable manner. Even with the latest and most approved type of plant, embodying high vacuum, suitable heating, and most efficient design generally, several difficulties have still to be encountered, some of which are here described and dealt with. The principal aim is to get maximum splitting, as near 100 per cent as possible, especially with low-grade fats, fish oils, etc.; but in such cases very careful prior refining is essential. Both the percentage of neutral fat and also that of albuminous matter need careful watching. With continuous or thin-layer distillation a high content of neutral fat is more objectionable even than with batch distillation. Another point is to reduce the residue from first distilling to a minimum. Reference is made to recent attempts to combine glycerine recovery, fat-splitting and distillation in one continuous process.

Sulfur Soap Cracks. L. A. Pelton. *Food Ind.* **8,** 65-6 (1936). Medicinal soaps containing a fraction of a per cent of colloidal sulfur often develop rather deep cracks running in both directions. Since it has been found that other soaps made with the same toilet soap base, but containing such additions as mercury or carbolic acid do not behave in this way, the trouble is attributed solely to the presence of sulfur. The behavior of such a sulfur-containing soap can be greatly improved by the addition of from 1 to 3 per cent of casein. The casein solution is prepared as follows: Mix 2 kg. of alkali-soluble casein with 3 kg. of cold water. (1 kg. equals 2.2 lbs.) Let stand 1 hour to

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soften up the casein. Stir into this a boiling solution of 200 grams (0.2 kg.) of borax dissolved in 5 kg. of water. Stir in from 100 to 200 grams of ammonia-water, specific gravity 0.910, until the whole is smooth and homogeneous. The mass should be clear after the addition of ammonia-water—usually 100 grams is sufficient. After cooling, from 1 to 3 per cent of this casein solution is used to increase the plasticity and homogeneity of the sulfur. (*Soap* **XII,** [5] 66.)

The Unfavorable Effect of Synthetic Detergents on the Washing and Foaming Power of Soaps. Welwart. *Seifensieder-Ztg.* **62,** 841-2 (1935). Although the combination of a small amount of soap (10-15%) with a synthetic washing agent, prepared according to French patent 679,186 or British patents 341,053 and 343,524, had a washing power greater than either of the two cleansing agents alone, foaming and washing power were practically destroyed on increasing the ratio of soap to washing agent to 3:1. (*C. A.* **30,** 2416.)

The Reaction of Borax-glycerol-water Solutions. P. van der Wielen. *Pharm. Weekblad 72,* 875-7 (1935). A table and graph are given showing the variations in pH of 85.8-0.0% glycerol solutions containing 2, 6, and 10% borax. (C. A. 29, 20, 6825, October 20, 1935.)

Nonfreezing Lubricants. Yoshio Tanaka, Ryonosuka Kobayashi and Toyoyuki Tsukuda J. Soc. Chem. Ind., Japan, 38 Suppl. binding 440-2; Proc. Imp. Acad. (Toyo) 11, 295-7 (1935).

I. Production of Nonfreezing Lubricants by Adding Hardened Fatty Oils, etc.

Additions of hardened fatty oils (fish oils), glycerides of the saturated acids in the fatty oil or semi-hardened fatty oil and saturated constituents of high molecular weight in the polymerized fatty oil exerted a favorable effect on lowering the melting point of mineral lubricating oils, and the effect increased with increased concentrations of the saturated constituents in the fatty oil or polymerized fatty oil. Experimental data are presented for various kinds of additions and for ranges up to 10 per cent by volume of added substance. M. -p. depressions up to about 40° were obtained. The effect of the addition of the saturated glycerides is believed to be due to their high molecular weight and minute crystal structure, which exert a retarding action on the crystal growth of paraffin wax, thus creating a mobile suspensoid on extreme cooling.

II. Production of Nonfreezing Lubricants by Adding Saturated Aliphatic Acids. J. Soc. Chem. Ind., Japan 38, Suppl. binding 442-5 (1935).

Saturated monobasic acids (C_2 to C_{22}) in concentrations up to 1.0% by weight lowered the melting point of a lubricating oil (asphalt-base spindle oil, m. —42°, $d\frac{30}{4}$ 0.8958), and the higher the molecular weight of the acid, the lower the melting point of the blends. Dibasic acids in general also depressed the melting point but the effect seemed to be independent of the concentration of the added acids, probably on account of their low solubility in mineral oils. Nonfreezing clock oils were produced by dissolving .02% by weight of hardened fish oil (m. 56°, I no. 11.0) in mixture of liquid paraffin and white spindle oil. Many experimental data are given. (C. A. 29, 22, 8307, November 20, 1935.)

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Detergent for Use in, and the Process for, Washing, Laundering, or the Like. British Patent 440,952, April 9, 1934. U. S. 2/24/34. Electric Smelting and Aluminum Company. The detergent consists of a mixture of separate grains simultaneously suspendible to the solvent action of H_2O and having different rates of dissolution so that in the bath there are formed successively solutions of different chemical composition at time intervals sufficiently long to permit successive detergent actions on the goods. A typical detergent contains Na_3PO_4 or NaOH, or Na_2CO_3, albumin, a hydrated Na or Na-Al silicate (cf. B. P. 200,175; B., 1923, 841A), a similar anhydrous silicate (cf. B. P. 339,355 and 357,224; B., 1931, 202, 1092), and a soap of relatively high titer. (*Brit. C. A.* **1936B,** 285.)

Monoglycerides of Fatty Acids. British Patent 440,838. Imperial Chemical Industries, Ltd., Millbank, London; T. P. Hilditch, The University, Brownlow-hill, Liverpool, and J. G. Rigg, 32, Thirlmere-St., Wallasey. Monoglycerides or mixtures of glycerides rich in monoglycerides are obtained by the direct esterification of one molecular proportion of fatty acid or acids with more than, preferably three or more, molecular proportions of glycerol in a solvent medium comprising a phenol or a mixture of phenols. Phenol, the cresols, or the xylenols, or mixtures such as commercial cresylic acid may be used. An aromatic sulphonic acid such as naphthalene-$_B$-sulphonic acid, or camphor-$_B$-sulphonic acid may be employed as a catalyst. The reaction temperature may vary between 180° and 120° C. After the esterification the phenol may be removed by distillation in a current of steam or in a vacuum and the residue washed with alkali to remove any unchanged acid. Examples are given of the esterification of stearic, oleic, palmitic and lauric acids. The Provisional Specification is not restricted to the employment of excess of glycerol. Specification 317,735 (Class 2 iii) is referred to. (*Oil and Colour Trades J.* **89,** 1959, 1421 [1936].)

Condensation Products of Phenols and Their Derivatives with Unsaturated Fatty Acids, Etc. U. S. 2,031,586, February 25, 1936. Josef Binapfl and Johannes Kuchenbuch (to I. G. Farbenind. A.-G.). Products which are of oily to rubber-like consistency are produced by reaction of phenols, chlorophenols, alkylphenols, ethers of phenols and esters of phenols with monocarboxylic acids such as PhOAc or the like upon unsaturated fat acids or fatty oils and natural fats such as those of linseed oil, the glycerol esters of such acids or their mixtures as contained in natural oils and fats such as olive oil or linseed oil or stand oils, in the presence of B fluoride. Various samples are given. Cf. C. A. 29, 8181. (*C. A.* **30,** 2293.)