ble in an extraction plant from an odor and taste standpoint. These compounds are far more likely to be present in naphthas made direct from crude oil than in those made from natural gas, this being due to the higher temperatures employed in the manufacturing process causing some "cracking" or decomposition even though pure paraffin or naphthene base crude oils are used. Likewise, naphthas made direct from crude oil are likely not to be as good from a sulphur and nitrogen standpoint, as well as from a greasy residue standpoint, as those made from natural gas.

The extraction plants in Europe have used naphtha of about 160 to 185° F. general boiling range, the material probably being made from Rumanian, Russian or other naphthene base crude oils and probably being essentially a cyclohexanes fraction. However, as most of the producers of industrial naphthas in the United States are operating with paraffin or mixed base crudes, such a boiling range as this in this country is not as desirable as either the 146 to 158° F. or 190 to 208° F. boiling ranges. This is plainly seen when one refers to Table IV. There simply are not commercial quantities of paraffin hydrocarbons which have boiling points such as to give a naphtha of 160 to 185° F. general boiling range. Such a boiling range of course can be made from paraffin base crudes by blending hexanes and heptanes together, but such a fraction obviously would not be as good as that of either the pure hexanes or heptanes.

In conclusion it might again be pointed out that extraction naphthas are mixtures of various hydrocarbons, each of which has its own particular boiling point, solvency and other properties, and that it is therefore possible to have two or more naphthas of practically identical general boiling range which yet may be entirely different in chemical composition. The best naphthas to use, from the standpoint of stability, evaporation loss, corrosion, greasy residue, odor and taste, are the narrow boiling range hexane and heptane fractions.

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Society work of the D.G.F. 6 Rept. The method of writing the abbreviations of characteristics. H. P. Kaufmann and H. Fiedler. *Fette u. Seifen* **44**, 399-400 (1937).—The German abbrev. for characteristics of oils are given.

Herring oil: A report dealing with lack of fat. W. Ludorff. *Fette u. Seifen* **44**, 416-20 (1937).—Monograph on the herring and herring oil industry.

Chemical industrial control in an oil factory. M. Singer. *Seifensieder-Ztg.* **64**, 783-4, 803-5, 824-5 (1937).

The refining of fat: The bleaching of fat from a nutritional standpoint. W. Halden. *Fette u. Seifen* **44**, 346-8 (1937).—The effect of refining and various treatments on the vitamins A, D and E and provitamins A and D are tabulated.

Evaluating the fish liver oil emulsions. H. Werner and H. Schmalfuss. *Fetten u. Seifen* **44**, 348-51 (1937).—Detn.: 15 g. of emulsion are weighed in an evap. dish of 8 cm. dia. and mixed with 40 g. of H_2O free Na_2SO_4. The materials are now extd. in a Soxhlet app. The ext. is placed in a bottle contg. a 2 hole stopper. In one hole a tube is placed through which N gas can be blown. The evapn. is done on a steam bath while blowing N over the ext. The wt. gain of the containers is equal to the oil in the sample. Methods of detg. characteristics are given. The toxicity of the oil is indicated by its aldehyde and ketone content. In prepg. emulsion 1/10 of the vitamin A is lost while the vitamin D remains unaltered.

A routine test for the detection of highly hardened oils and mutton and beef fats in butter and ghee. V. Venkatachalam. *Analyst* **62**, 732-3 (1937).—Method: The butterfat or ghee is filtered through a dry no. 4 Whatman filter-paper into a 30 cc. beaker maintained at 60° C. in an air oven. One cc. of clear fat is run into a test tube (16 cm. long and 16 to 18 mm. dia.). Fifteen cc. of a mixt. of acetone and alc. (650 cc. dry acetone made to 1 L. with absolute alc.) are added and the test tube is warmed, shaken and stoppered. It is left for 3 hrs. in a water bath maintained at 30° C. ($\mp$ 0.1° C.), after which it is removed, without shaking and examd. in transmitted light. Even the slightest deposit of crystals is a definite indication of the presence of mutton or beef fat or of a hardened oil.

A further study of the component acids of ox depot fat, with special reference to certain minor constituents. T. P. Hilditch and H. E. Longenecker. *Biochem. J.* **31**, 1805-19 (1937).—A detailed study of three beef tallows has indicated certain general features of land animal depot fat. The major components are oleic (38.0-40.4%), palmitic (26.5-31.0%) and stearic (20.1-25.4%) acids. Among the minor component acids are 2 unsatd. members of the oleic acid series, myristoleic ($\Delta^{9:10}$-tetradecenoic acid) and palmitoleic ($\Delta^{9:10}$-hexadecenoic acid). The presence of these acids has been proved and their constitution detd. They have not previously been reported as components of the fat stores of higher land animals. A study of the constitution of the C_{18} unsatd. acids has shown that they are a

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mixt. consisting chiefly of oleic acid ($\Delta^{9:10}$-octadecenoic acid) and a small amt. of a geometrically isomeric linoleic acid ($\Delta^{9:10,\ 12:13}$-octadecadienoic acid). The presence of small amts. of myristic, arachidic, arachidonic and possibly lauric acids is also discussed.

The position of the unsaturated linkage in the hexadecenoic acids of certain natural fats. J. M. Spadola and R. W. Riemenschneider. *J. Biol. Chem.* **121**, 787-90 (1937).—The hexadecenoic acid present in goat milk fat, egg yolk glycerides, and the depot fat of the white rat is chiefly the 9, 10-hexa-decenoic acid.

The chemistry of fat spoilage. 1. Ketonic turning of lard. K. Taufel and F. Kiermeier. *Fette u. Seifen* **44**, 423-4 (1937).—Zinov'ev and Drucker (Masloboino Zhirovoe Delo **13**, No. 2, 6-8) reported that in spoilage of lard the peroxides were formed before the ketones and that both processes are greatly increased by light. The present authors tested the behavior of lard toward rancidity tests on standing in light, in the dark and in a room at several low temps. Under all conditions the ketone reaction was positive before the Kreis or Fellenberg reaction. Positive Ketone reaction was obtained even for a sample stored one month at —8.5° and whose final Lea's reaction was 0.08.

The volumetric determination of water in fat, butter and margarine as well as other materials. I. (Studies in the fat field 38.) H. P. Kaufmann and S. Funke. *Fette u. Seifen* **44**, 345-6 (1937).—The detn. depends on the reaction $I_2 + SO_2 + 2H_2O = H_2SO_4 + 2HI$. The soln. for the detn. is prepd. of 254 g. I in 5 L. of abs. MeOH and 790 g. pyridine is added. After cooling 192 g. SO_2 are added from a cylinder. All reagents must be dry. The samples (20 to 50 g. oil) are dissolved in ½ the amt. of decalin ($C_{10}H_{18}$) and 25 cc. of 100% MeOH. The I_2 uptake is detd. by the diff. between the sample and blank titrations. Results on several oils are tabulated. The method is satisfactory and rapid. Only disadvantages are the sensitivity of the soln. to air moisture, slight difficulty in detecting end point and the method is not applicable to soap.

The volumetric determination of water in fat, butter, margarine and some other materials. II. Studies in the fat field 40. H. P. Kaufmann and S. Funke. *Fette u. Seifen* **44**, 386-7 (1937). The volumetric method for moisture detn. by Smith and Bryant [J. Am. Chem. Soc. 57, 841 (1935)] was found to compare well with the I-SO_2 and gravimetric methods. Method: 20 to 40 g. oil are weighed in a ground glass stoppered flask, and 5 cc. of pyridin is added. To this are added 10 cc. of ½ N acetylchloride soln. (in CCl_4) from a burette whose tip just touches the oil. The mixt. is shaken and left to stand ¼ to ½ hr. Then 5 cc. of aniline are added, shaken and let stand 10 min. Titrate with 0.25 N alc. KOH. Correction is made for the acid in the oil.

Effectiveness of arachidonic acid in curing "fat deficiency" disease. O. Turpeinen. *Proc. Soc. Exp. Biol. & Med.* **37**, 37-40 (1937).—The tests reported here already justify the conclusion that arachidonic acid is at least approximately 3 times as effective as linoleic acid in curing the "fat deficiency" disease. The effectiveness of arachidonic acid as a curative agent might seem to be in contradiction to the finding by Spadola and Ellis that the rat is able to synthesize this substance. The controversy can be eliminated, however, by assuming that this synthesis can take place only from linoleic acid, which assumption seems to be in full accordance with the experimental data of the above mentioned workers. The superiority of arachidonic to linoleic acid as a curative substance would suggest the tentative hypothesis that the need of the animal organism might be primarily for the former acid and that linoleic acid could be beneficial solely on account of its conversion into arachidonic acid in the body.

The effect of supplementary methionine and cystine on the production of fatty livers by diet. H. F. Tucker and H. C. Eckstein. *J. Biol Chem.* **121**. 479-484 (1937).—When a diet contg. 5% casein and 40% lard is supplemented with 0.5% cystine, the total lipid content of the rat livers is 57% more than when the cystine is omitted. This confirms the observations reported by Beeston and Channon. When a diet contg. 5% casein and 40% lard is supplemented with 0.5% methionine the total lipid content of the rat livers is 41% less than when methionine is omitted.

Butter preparation. W. Mohr. *Fette u. Seifen* **44**, 375-83 (1937).—A good discussion on butter manufacture.

Method of procedure in the salting of margarine. O. K. Palladina. Voprosy Bakteriol. Technol. *Margarina* **1935**, 139-50; *Chem. Zentr.* **1936**, *II*, 212.—Dry NaCl (not more than 2-2.5%) is added to the margarine after passage through the cooling drum. Margarine prepd. with sour milk is best salted with a NaCl soln., as in this way greater homogeneity, freedom from flakiness and better utilization of the NaCl is obtained. Aq. NaCl solns. vigorously attack the equipment; the corrosive action of solns. in milk is much weaker and when mixed with oil the salt soln. has no noticeable action on the app. The lactic acid mass of the sour milk is entirely preserved by the soln. in it of 5% NaCl (Chem. Abs.).

Tall-oil fat acids from a chemical and technical viewpoint. H. Niesen and L. Ubbelohde. *Fette u. Seifen* **44**, 426-32 (1937).—The fat acids of tall oil were separated from the resin acids and their characteristics reported. Calcn. of the compn. according to Kaufmann gave oleoic acid 22.7, linoleic 71.3 and linolenic acid 6.0%. Oxidation products of the acid per Hazura, hexabromides and hydrogenation with analysis indicated that the original acids were oleic, linoleic and linolenic. The glycerides of tall oil fat acids were compared with linseed oil; the drying curves gave a normal drying curve course. The acid glycerides alone gave poor drying qualities because of the low (6%) linolenic acid content. Tall oil glycerides contg. the original resins were too brittle and weather very shortly. It was concluded that tall-oil could yield a usable coating material if it is processed by high vacuum distn. for sepn. of the various constituents.

Sensitive reaction for testing for mineral oil in the oils of animal and vegetable sources. H. M. Ulrich. *Fette u. Seifen* **44**, 426 (1937).—Two drops of oil are placed in a test tube with about 1 c.c. of alc.

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(95%) and warmed; 1 c.c. of alc.-KOH is added, the test tube attached to 1 m. glass tube and oil is saponified on a water bath for ¼ hr. After cooling alkannin soln. (alkannin fat sol. red in alc.) is added until the solns. are blue. Then 5 drops of sudan soln. (Sudan 7B in alc.) are added. The soln. is poured out and the test tube rinsed and filled with distd. water. A red ring on the test tube at the boundary where the blue soln. had been indicates that mineral oil was present. The sensitivity of the reaction is improved by using ice cooled distd. water and by centrifuging the test tube.

Consistent fats (greases). G. Ritter. *Chem.-Ztg.* **61**, 908-10 (1937).—Discussion on the fats and metallic soaps used for manufacture of lubricants.

Polymerization of fat. II. The action of sulfur monochloride on fat (Studies in the fat field 39-41). H. P. Kaufmann, J. Baltes and F. Mardner. *Fette u. Seifen* **44**, 337-40, 390-4 (1937).—Data on the reaction of sulfur monochloride on several oils and fat acid esters are presented.

Fats as protective coatings and their substitutes. J. Scheiber. *Fette u. Seifen* **44**, 323-30 (1937).

Tropic lacquer. E. Fonrobert and K. Bruckel. *Fette u. Seifen* **44**, 432-4 (1937).—A tropic lacquer should be formulated to withstand both intense humidity and sun rays. A lacquer which is stable against the tropical weather is prepd. with "albertol" using a 1:1 linseed and wood oil mixt. A film with a larger proportion of linseed oil softens during considerable rain. Linseed to wood oil ratio should not exceed 1:2 to preserve the elasticity. A recommended formula is: 1 part Albertol III L (a phenol resin condensation product m.p. 106-133° C) 1.7 pts. thickened wood oil and 1.7 pts. of linseed oil stand oil.

PATENTS

Preparation of emulsions. R. C. Newton, W. F. Bollens and L. C. Brown (to Industrial Patents Corp.). U. S. 2,098,010. One object of the invention is to provide a method of manufg. oleomargarine, butter and similar emulsions whereby a very finely emulsified product is produced. The oil or fat is melted, water is added, the mixt. is cooled quickly to a temp. considerably below its congealing point, the mixt. is immediately agitated to secure a fine degree of dispersion of moisture throughout the oil, and the oil is permitted to crystallize at or slightly below its congealing point.

Treatment of olive oil to prevent stearin coming down at low temperatures. W. Clayton, S. Dack, J. F. Morse and R. I. Johnson (to Crosse & Blackwell Ltd.) U. S. 2,097,720.—Small amts. of polymerized oxidized mono-unsatd. disatd. glyceride or oxidized cacao butter are added.

Stabilization of baking fat. Industrial Patents Corp. Ger. 650,285 Cl. 53h G 1/03. Addn. to 628,690. —A small amt. of distillate from the deodorization of sesame oil is used as an antioxidant.

Apparatus for extracting oils from oleaginous materials. H. H. Bighouse (to the C. O. Bartlett & Snow Co.). U. S. 2,096,728.—Structural features of an extn. app. built on the counterflow principle are described.

Stabilization of glyceride oils against oxidation. S. Musher (to Musher Foundation, Inc.). U. S. 2,093,-971.—Crushed sesame seeds are used as antioxidants for oils and fats.

Improving oils and fats and other glycerides of fat acids. W. Ekhard. Brit. 465,111. A process for improving the odor, taste, stability and consistency of vegetable and animal oils and fats and other glycerides of the fatty acids by means of microorganisms which comprises intimately mixing by mechanical means the substance to be improved with an aq. soln. of sugars as fermentable medium which is caused to undergo intensive fermentation by means of sugar fermenting microbes, such as saccharomycetes (yeasts) or acidifiers, for instance, lactic acid producers such as bacillus Leichmann, bacillus bulgaricus, streptococcus thermophilus, or other acidifiers such as microbes producing propionic acid, butyric acid and other organic acids and after the fermentation has ceased, separating the treated material from the products of fermentation and all other substances.

ABSTRACTS

Soaps

***Edited by* M. L. SHEELY**

How Detergent Solutions Work. *Chem. Trade J.* 13 (Jan. 1, 1937).—It is possible to distinguish between at least 5 different, but related, processes which possibly occur when a wetting (or detergent or emulsifying) agent is dissolved in water and brought into contact with greasy matter. These are: (a) Lowering of the surface tension of the water; (b) wetting of a solid surface; (c) penetration of the aqueous solution into capillary spaces, such as those in a heap of coal dust or a sized or greasy textile fibre; (d) dispersion or emulsification of grease or other hydrophobic dirt in the water; (e) detergent action.

There is some little experimental evidence that a low surface tension of the aqueous detergent solution against air, or a low interfacial tension against oil, are not the sole, or the predominating, factors in producing a good detergent. Many substances lower surface tension considerably, but have no detergent action worth mentioning; an example is soap and alkyl sodium sulfates.

Measurements (Robinson and Selby) of the interfacial tension between various detergent solutions and oils have shown several points. Sodium cetyl sulfate lowers interfacial tension very little more than sodium cetane sulfonate, but washing tests show that generally the cetyl sulfates are much better detergents than the cetane sulfonates.

The importance of other factors in detergent action has been shown conclusively by the fact that different